THE · TECH-NIQVE · OF SCVLPTVRE

BY · WILLIAM ORDWAY PARTRIDGE

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PREFACE.

THE chief object in the publication of this book has been to offer a practical as well as a theoretical knowledge of sculpture. Suggestions have been made that may prove useful even to advanced students, although the author had in mind, mainly, the thought of furnishing a guide to beginners. A brief account has been given of the history of sculpture from prehistoric times, in order that the student might know how sculpture came to be, what the world has produced in this art, and what principles have guided the great masters.

The author has been led to undertake this work because of the many questions asked him regarding the technique of his art. Many still think that a sculptor, when he wishes to produce a statue, obtains a block of marble and carves directly from the stone. The whole process, from the working of the clay to the final execution in bronze and marble, has been gone over; sketches have been made especially for this book, designed to illustrate the difficult processes which it is next to impossible to describe by word alone. It is believed that these sketches will be of great value to the lay reader as well as to the professional student. The drawings were made with great care and especially for this work by Charles M. Sheldon and Vesper L. George. Much more might have been written; but brevity has been aimed at, so that the book produced might be easily handled. The author has drawn from every source possible. The data and facts contained have been gathered from

many men and books, and tested by actual experience. It is hoped that the work may not only fulfill its designed mission, and be helpful to the student who may have to work alone, but that it may lead to a more definite and sympathetic understanding and appreciation of the great, calm, and enduring art of sculpture.

In his book "Art for America" the author has attempted to show that sculpture is not declining, that so far from being a lost art, it is one that we have only now thoroughly discovered, and that the American people are actually on the threshold of an art era that may, if properly evolved, prove as beautiful, expressive, and inspiring as is the sublime sculpture of Greece. More nonsense is taught and written to-day about sculpture than about any other of the arts. It is full time we gave to this subject the serious consideration it merits. It has been the aim, in this book, to speak of the art as it really is, and the work is given forth with the hope that it may result in the creation, to some extent, of a fresh interest in sculpture.

LIST OF ILLUSTRATIONS.

TECHNIQUE OF SCULPTURE.

PART I.

HISTORY OF SCULPTURE.

THE art of sculpture represents objects by a solid likeness to their forms. These are carved in relief or detached entirely from the background. In speaking of sculpture we may include figures in bronze or other metals, as well as figures in stone or marble. The desire to commemorate in some palpable form the memory of extraordinary events and persons was doubtless the origin of this art among men.

Sculpture is, literally, the process of graving or cutting hard material. The word is derived from the Latin *sculpo*. It is commonly applied to artistic carving or cutting. In this sense processes which do not, strictly speaking, involve the cutting of hard substances, are included in the term. Sculpture as a fine art includes, then, the molding of soft materials as well. Clay, and often wax, have been employed from the earliest times, either for making sketches or models for reproduction in marble or bronze, or as a vehicle for finished work.

Sculpture is the oldest of the arts. Long before the Scriptures were written we find products of it in ancient Egypt. It is the most enduring, as well as the most ancient, of all arts. The first savage

who scratched a design upon a flat surface was a sculptor, however crude his work.

From the beginnings of art in Greece, where it afterward found its most perfect expression, we may trace the entire history of a school of sculpture. The savage races of to-day have rude carvings similar to the prehistoric Greek. Among the Mojave Indians of the great desert of Arizona we find specimens of a crude handiwork, reminding us of the early dawn of Grecian art, which, in later years, reached its zenith and afterward fell into decay.

A child, beginning to model in clay, works in the same manner as did the early Greeks in the infancy of their art. The individual is an epitome of the nation. From this simile we may understand how sculpture arose. Not, however, until man had learned to control himself and to master the stubborn material which he found at his hand do we find anything worthy to be called sculpture.

The earliest statues were, in all probability, of men and not of divinities. Religious feeling later led to the giving of divine attributes to men and these forms began to appear in sculpture. The first traces of sculpture in connection with worship are found among the ancient Chaldeans.

Egypt. — We may pass over the sculpture of India, which is fantastic and grotesque, and come at once to Egypt. The grand and stately sphinx of Gizeh is, perhaps, the first great monument of which we have any knowledge which may be called a work of art. From its creation we may classify as sculpture the ideas which men have sought to put into stone and bronze, expressing their feelings for beauty and divinity as best they could. It is with such, rather than with the fantastic and untutored barbaric carvings, that we have to deal.

The Old Testament contains the earliest known names of sculptors. They were the artists employed upon the Tabernacle. They date

from about 1500 years before the Christian era. Of art in Egypt we have more certain traces. A molten calf and a brazen serpent, of which we read in the Scriptures as objects of worship or reverence, are evidences of art traceable to Egypt.

Assyria. — Sculpture is found among the Assyrians, and recent interesting discoveries have given the world much knowledge concerning the art of sculpture among this people. Especially in and about Nineveh, the ruins of which have been of late years uncovered, are evidences of it found. Assyrian sculpture was chiefly decorative and was used to record remarkable incidents in the history of the nation, or the valor of its kings. Many colossal figures have been found, combining the human with the brute, typifying the union of intelligence with force.

Assyrian sculpture exhibits an intimate knowledge of animal character and action. The reliefs with which the walls of apartments were often decorated, represented battles, sieges, lion-hunting, the crossing of rivers, and many details of everyday occupations. Every circumstance is noted. The vegetation of the country is shown; the animals in common use, and even the tools of the sculptors are represented.

Assyrian sculpture was evolved from the rude arts of the Chaldeans, although remaining undeveloped. We may say it dated from the twelfth century, B.C. It is conventional, in the main, but yet has distinct realistic elements. The action is fervid and spontaneous. This sculpture shows a remarkable knowledge of animal life and habit, as is evinced in the relief of the Wounded Lion, so familiar to art students.

That the Assyrians were skilful is readily seen by their clever execution. There was a prescribed form for treating the human figure. The same outline, as of one family, or even of one individual, is found in all the faces. There is in all the same square-cut, braided

beard. There is one expression throughout, a complaisant smile, which lights the countenance, no matter how serious the occupation. This is a curious characteristic of all prehistoric sculpture.

In considering the sculpture of Nineveh, it must be remembered that we are discussing the art of a city destroyed in the year 606 B.C., hence the *relievi* which we see in the museums, taken from the ruins of this city, are certainly upwards of 2500 years old.

In the later Assyrian sculpture one traces clearly the influence of the Egyptian. Indeed the sculpture and art of each people was largely influenced by their mutual intercourse. Assyrian sculpture cannot be classified among successful works of fine art. Though of clever execution, it is of a conventional type, and belongs to a fixed, not a progressive, school. It is chiefly interesting to us from an historical standpoint.

Persia. — Persian sculpture can easily be traced to an Assyrian origin. It was never developed into an art of beauty. National prejudice was against it and led the Persians to destroy the works of art of other countries. Xerxes was induced to destroy the temples in Greece, regarding them as impious, and statues were defaced under the same feeling of religious prejudice. The sculpture of Persia cannot be said to have a distinctive character.

China and Japan. — The sculpture of China and Japan need scarcely be considered. It is mostly of a mythological character, with monstrous combinations of human and brute forms, repulsive in their ugliness and in outrageous defiance of rule and possibility. The subjects are remarkable chiefly for their colossal dimensions and elaborate ornamentation. In fact, the striking feature of all eastern monuments is the vastness of scale and a certain tranquillity of expression.[1] In the art of bronze-casting

[1] With few exceptions it may be noted that the ruling sentiment of all early sculpture was repose.

China, however, has made great advances, some of the Chinese bronzes being the most wonderful in the world.

Neither China nor Japan has derived its knowledge of art from Europe. It is peculiar to them, and most interesting on this account. Chinese art was evidently the parent of Japanese art. It is less original, but has greater technical completeness and method. Chinese art is more restricted. The Japanese work bronze in a wonderful manner, inlaying it with other metals. Detail is most carefully and ingeniously wrought out, and shows spirit and freedom. Motion is cleverly represented, without destroying the artistic balance of the whole work. This art is chiefly decorative in idea and treatment. It is said that their creed and customs forbid the study of anatomy, which accounts for the bad modeling and drawing of the human figure, while other forms are cleverly given. In fantastic art they have no equals, and show peculiar talent for caricature. Their feeling for beauty is lofty, as their landscapes and bronzes of animals and birds well show. Dragons and weird monsters are shown, and water is imitated in bronze with marvelous fidelity.

What has been observed of the Chinese and the very odd Japanese sculpture is equally applicable to recent discoveries in some parts of South America. The interest in these subjects is chiefly for the scholar and the antiquarian, and has little or no connection with the progress of art. While the facility of execution shows long practice, no conjecture can be formed as to the date of these works.

Greece. — Having thus briefly considered the beginnings of the art of sculpture, let us pass on to Greece, where it reached its highest and noblest development. However original Greek genius may have been, its art was not indigenous. If one studies the lions of the gates at Mycenae, he recognizes Greek indebtedness to Assyrian influence. Greece absorbed, slowly and surely, all that was monumental, calm, and beautiful in Egyptian art, and in the

arts of the peoples along the shores of the Mediterranean. It is not difficult to trace back the Apollo of the Belvedere to the stiff Egyptian figure, with its arms locked closely at its side, and its body knit together in all the possible conventionalities of a tyrant-ridden people.

Greece was not limited to the little country which bore the name. We must think of her only as an influence, something like England of to-day, only higher in her civilization and broader in her culture. Her territory was largely mountainous, as is Switzerland. The small plains or valleys naturally brought men together and led to the building of cities, that, from their isolation, became different one from the other. While Greek life and language were alike throughout Hellas, the manifestations of that life and thought in sculpture and architecture were as different as French art to-day is different from that of Italy or Spain; yet each people was upon, or in easy access to, the sea, which was and is a great educator. They were in communication with all peoples and civilizations, more shut off from themselves than from the outside world, of which Greece was the centre. The Greek, as we learn from Homer, was an extensive traveler, and brought back whatever was worthy from foreign countries, to make it a part of his own dearly beloved land and her institutions.

The language was the language of Homer, as we find it in the Iliad. While thus one in thought and language, Hellas was still separated politically into about twenty different states, and was as much akin to Switzerland politically as it was geographically. Each state, however small, was perfect in its government, having its own customs, gods, creeds, and ideas. Historians tell us that such political and geographical conditions were most favorable to the development of genius in arts and letters. Active competition ripened all that was manly and progressive, through state pride. At certain great festivals men came together from all parts of

Greece, and a cosmopolitan idea was developed. A Greek not only knew the customs, politics, and arts of the state from which he came, but he learned, by this intercourse, to have a sympathetic respect for all.

The climate of Greece is most favorable to the development of art. One may sleep in the open air for more than one-third of the year. Excessive cold is as rare as enervating heat. Thus did the Greek escape the phlegmatic nature of the northern barbarian and the intemperate and sluggish nature of the south. The gymnasiums provided for the body, as did the groves of Plato for the soul and mind. To the Greeks the nude figure was the most perfect symbol of beauty which sculpture could embody. At the Olympic games the sculptors had an opportunity of studying the human form, under the most favorable conditions. These games of the Greeks were full of joy, and in preparing for them, men grew strong unconsciously. It is this joy of unconscious strength that makes Greek sculpture preëminently beautiful. In these games, both men and women were wont to exercise entirely nude; at least this was the case in Sparta. The passion for pure beauty seems to have dominated all other passions.

The Greek demanded not only perfect form and complete technical knowledge, but asked, moreover, that the subject be at once agreeable and noble. In action, pose, drapery, and idea, in the rendering of force and passion, he was required, by public feeling, to avoid the ugly, extravagant, and ignoble. At Thebes there was a law to this effect. The one thought and aim was to uplift humanity, by keeping before it the most perfect physical form. Indeed, prizes were offered at public competition for the most perfectly developed forms, both of men and women.

The Greek not only detested the ugly, but he avoided, from instinct, all exaggeration and caricature. Artifice and trickery had no place in an art where beauty was the sole aim. Impiety was

thought to be impossible in a beautiful man or woman. The education of the Greek was as many-sided as was the beautiful land he inhabited. It included in its curriculum the intellectual, physical, moral, political, social, and æsthetic. Every side of the man was rounded out, and he came forth from the schools, and remained, a cultured being. Imagination grew naturally, as a tree grows, under benignant skies.

From these conditions it is readily seen that sculpture rose spontaneously, and could not help reaching its highest possible development. Spiritual beauty, expressed in the most perfect physical form, was what the Greek nation demanded, and what the Greek sculptor gave.

In the Æginetan marbles, produced fifty years before Phidias, is struck the first sublime note of Greek sculpture. Myron, who preceded Phidias and was his elder, is known to us through his Discobolus. Among the Greeks he was held in high esteem for his animal sculpture.

Fifth Century, B.C. — The art of sculpture culminated in Phidias, a contemporary of Socrates and Sophocles. No fragment has ever been discovered of that wonderful statue of his creation, the Athena Promachos, which stood upon the Acropolis, terrifying the invader. The frieze and two fragmentary pediment groups, together with the metopes, are all that remain of the sculpture of the Parthenon, probably the most perfect building in proportion and rhythmic beauty that the world has ever known. These fragments indicate the handiwork of a symmetrical, firmly poised mind, and a hand thoroughly trained to execute its dictation. The handling, while broad and simple, exhibits a subtlety of finish, in the relation and value of plane to plane, that would fascinate one with its details, were one not impressed at once with the beauty of the whole. Art, here, is free from all conventional restriction, although it is evident

that the work was carefully planned before chisel was put to marble. This is shown by the adaptation of each figure to the place it fills. All this, too, shows a consummate knowledge of composition and a mastery of its principles. The pediment groups represent incidents in the life of Athena. The stately march of the processions in the frieze charms us without wearying. What calm joy pervaded these pagan festivals!

One cannot leave Greek art without glancing at the stately female figures, known as the Caryatides of the Erechtheum, bearing so lightly and so elegantly, and with such unconscious grace, the weight of the entablature. The chief attraction and characteristic of the Phidian epoch is the sublime dignity and calm serenity that invests all sculpture and architecture. It was an age of great men, —of Phidias, Æschylus, Sophocles, and Pericles.

The Neo-Attic school shows Greek art in its decadence, although charm and beauty have not forsaken it. The works of Praxiteles and of his contemporary, Scopas (400–350 B.C.), are full of an undulating loveliness. Art has now lost much of its sublime quality, but gained in sensuous beauty. The famous Hermes, found among the ruins of the temple of Hera at Olympia, in 1877, and perhaps the Venus of Melos, discovered much earlier, belong to this epoch.

The name of Praxiteles is the second among the great names of Greek sculptors. His work was less grand and noble than that of Phidias, but more sensuously beautiful. Although many of his statues are wholly nude, they bear no trace of licentiousness. The famous Hermes, mentioned above, although considerably mutilated, is regarded as one of the most beautiful pieces of sculpture in the world. At the date of its creation, art had still its canons of modesty. Good taste was not yet degraded by the sensuality that followed upon the death of that great sculptor, which occurred soon after the year 350 B.C.

The love of Praxiteles for pure beauty must have amounted to a passion. His art was beautiful in its symmetrical grace and refinement of contour. It represented the tender emotions of mankind. Cicero speaks of the wonderful expression with which his faces were endowed. His Venus of Cnidos was held by the ancients to be his masterpiece, and second only to the Jupiter of Phidias. Love was still spiritual as well as physical. Grecian civilization, giving way slowly before the advancing Roman, allowed art also to lose its divine calling and to become a pander to the lusts and ambitions of men.

Lysippus, adjuring all conventionalities, strove manfully to uphold its dignity ; but one man could not stay the fell tides of decadence. It was he who created the fine athlete, called the Apoxyomenos, now to be seen in the Vatican.

To be a great artist, in Greece, was to be the equal of the greatest in the land. How different with the Roman, who affected all that the Greek actually was ! To practice the fine arts in Rome was considered trivial and effeminate. The gross, sensual nature of the later Roman could not grasp the calm pleasures of pure form.

The decadence from Praxiteles is rapid, until the lovely art of Greece is entirely debased by the conquering, domineering Roman. The history of Hellenic art, its rise, palmy period, and decadence, which we can intelligently follow through the writings of the historians of Greece and Rome, in the light of modern research, we may take as an exemplar of all schools of art. In each the same sequence is shown.

Rome. — It was from Greece that Rome inherited almost all that she knew of sculpture. Something, undoubtedly, she possessed in Etruria. Etruscan sculpture, although lacking in creative genius, must not be wholly overlooked. We know very little of these early inhabitants of this part of Italy. Their architectural remains are of

great antiquity. We do not know whether the early colonists came from Egypt or Phoenicia, or Asia Minor. The colossal way in which the Etruscan ruins are constructed points, perhaps, as much to Egypt as elsewhere. Greek influence is plainly seen in whatever of Etruscan sculpture has come down to us, although the style is sometimes original. Some tombs have been lately discovered in Volterra and adjacent Etruscan cities, representing figures reposing upon sarcophagi. These figures form the covers of the sarcophagi, the dead having been placed in the receptacle below. Their forms lack elegance and are clumsily draped. The faces are believed to be portraits. Some approach beauty and are often pleasing in expression. From their appearance they might easily be attributed to the debased Roman school.

Of special interest in Etruria is the undoubted fact that all the art Italy had before she began to borrow from Greece was found in this province and is now called Etruscan. From Etruria Rome received many of her religious and political institutions as well as the greatest, perhaps, of her kings. The majority of the statues of Etruscan deities discovered are winged, as were those of Assyria. The greater portion of this work is done in terra-cotta ; marble seems to have been little known or used. From the East, probably from Phoenicia, the Etruscans learned the art of working metals and practiced it with great success. Etruria was filled with bronze statues, most of them statuettes, some colossal. A portion of a chariot, found at Perugia (now at Munich) shows crude monsters, which resemble Assyrian work. The Etruscans were a race of imitators. Having taken their art beginnings from the East, as did Greece, they advanced but little and clung to archaic forms, which the Greeks soon threw off. Etruscan art lacks ideality ; it is, for the most part, materialistic art and realistic portraiture. The Etruscans were ingenious and industrious, and developed technical skill sufficient to make them known at Athens and popular at Rome. We

know them to have been an opulent people, but lacking in refinement and given over to sensual enjoyments.

Both the British Museum and that of the Vatican possess many fine examples of their work in metals. The mountings of their ornaments and jewels were peculiarly beautiful, elaborate in design, and delicate in workmanship. Lacking in the fine physical development of the Greeks, they were accustomed to give to their work an extreme realism, thus widely varying from the Greek idea. We find among the names of Etrurian sculptors those of Volcanus of Veii (B.C. 616–578), who was employed by Tarquinius Priscus to make an image of Jupiter for the Capitol; Mamurius Veturius (B.C. 716–673), employed by Numa Pompilius to make a certain shield, like the sacred one which he thought had fallen from heaven.

In the toreutic art (metal-working) Etruria seems to have been especially successful. In the best days of Grecian art Etrurian goblets of gold, silver, and bronze were eagerly sought. Among the most beautiful of this work are the *cistae mysticae*, or cylindrical caskets of bronze, richly ornamented with graphite figures. The finest of these yet found is attributed to Novius Plautius. It was discovered near Palestrina in 1743. The date of its execution is probably about 250 B.C.

Historians do not mention a single native Roman sculptor. In arts, as in letters, the Romans borrowed from the Greeks. They were a people to whom the real was the most important thing in the world. Their sculptures are chiefly images of the Caesars and their unscrupulous wives, and of favorites of the day. Their statues were manufactured before they were needed, and heads were added to suit the reigning sovereign. The most complete collections of effigies of the Roman emperors extant is to be found in the Uffizi gallery at Florence, and the museum of the Capitol at Rome. The busts of Caligula and others are modeled with a vigor and technical power not unworthy of the modern French school. They are dis-

tinctly portraits. Augustus, Trajan, and Hadrian are favorite subjects. The Marcus Aurelius on the Capitol in Rome is one of the most famous equestrian statues in existence.

The Emperor Augustus boasted that he found Rome of brick and left it of marble. A taste arose among the Romans for collecting ancient works of art, a taste akin to the eagerness with which collectors search for old masters in our times. Cicero arraigned Verres for the base and ignoble manner in which that robber took from Sicily her finest works of art. Caesar encouraged the fine arts and planned many improvements which Agrippa afterward carried out. The noble temple called the Pantheon of Agrippa still remains intact. This was filled with statues of the gods. It was this building in which the Roman achieved his greatest architectural triumph.

Caligula and Nero, each in his time, aided in the spoliation of Greece. Not in time of war, but in time of peace, Caligula sent out an expedition under Mummius Regulus (consul, 31 A.D.) to bring away, by downright robbery, all the best statues from the Greek towns to adorn his villa. The Eros of Praxiteles is said to have been stolen by this expedition.

Thus Rome became the treasure house of Greek sculpture. It must have produced a refining influence upon the cultivated Romans; and, indeed, Roman literature tells of the rage for the possession of fine statues that became fashionable in Rome. It is recorded, to their glory, that the populace showed signs of mutiny when the statue of the Apoxyomenos was taken from the Baths of Agrippa to the chamber of Tiberius. A certain taste for the fine arts was developed, no doubt, in the Augustine age; but creative genius was scarcely alive.

The popular taste for fine arts in Rome finally resulted in the development of a school which may be called Graeco-Roman. To this school belongs the famous statue known as the Venus de Medici, now in the *Tribuna* at Florence. This statue was found in

fragments in the ruins of the Portico of Octavia at Rome. It was the work of Cleomenes, son of Apollodorus, a Greek artist living in Rome in the first or second century A.D. This statue cannot be said to be distinguished for its modesty, although the subject affects a modesty that makes the lack of it only the more apparent. The ruins of the Baths of Caracalla have yielded some good statues, among them the Farnese Hercules.

The rise of Christianity marked the decadence of sculpture. The early Christians regarded it as idolatrous to copy the human form, and many fine specimens of Greek and Roman sculpture were by them defaced or destroyed. In the sixth century art showed signs of awakening at Byzantium. Its inhabitants were noted for their skill in the cutting of precious stones and the working of metals. The influence of these people and of their art was widespread, and continued until the twelfth century. In this period Germany threw off Byzantine influence; but her Gothic period is scarce worth studying in sculpture. In the fifteenth century, Albert Dürer produced wood carving, and art again advanced. The notable names of this period are Adam Krafft (1430–1507) and the Vischer family (1435–1529). Their best work followed a Gothic ideal. Their figures were flat and square, and were clothed in drapery which hung in stiff, wood-like folds.

The Gothic Period.—The Gothic period lends its virility to sculpture as well as to architecture, and infuses into it a stern realism, unlovely but interesting. In the fifteenth century the figures that are found upon the Cathedrals of Chartres and Rheims, though Gothic in style, betray the classical influence. Here again, however, sculpture declined, and the fourteenth and fifteenth centuries produced little of merit. It must be borne in mind that this result was chiefly the effect of the invasion of Europe by Attila and other barbarian leaders. A merciless horde had swept from east to west,

crushing and destroying civilization, mutilating and breaking to fragments all monuments of art which it encountered. Before this invasion the empire of Rome fell, and for many years European civilization was plunged in darkness. It was the age of utter human degradation. There was nothing worthy of artistic representation, and art lay fettered and dormant. Out of this darkness the first glimmer of artistic feeling is seen among the Goths, the most intelligent of the invading nations.

The Italian Renaissance. — The first sculptor who dared to awaken art from her long and profound slumber, and to stamp upon her the vivid imaginings of his own genius, was Niccolò Pisano. He has been fitly called the father of modern sculpture. We hear of him first in the early part of the thirteenth century, and he was, as his name implies, a native of Pisa. He practiced, as was common with the early artists of this period, three arts — painting, architecture, and sculpture.

The revival of sculpture in Italy preceded that of painting. What sculpture we have, before Niccolò, is awkward indeed, and burdened with trivial detail. We know little of the history of this wonderful man; we are told he did his best work between the years 1260 and 1278. It is his sculpture in relief that is especially worthy of being studied. His reliefs are scattered through the towns of northern Italy, especially Pisa and Siena. One seems to trace clearly in his work the influence of Greek sculpture, and yet the design and sentiment have characteristics which may certainly be called original. No doubt the ancient sculpture which had been preserved in the Campo Santo of Pisa had its effect upon his style and technical execution. We know that, together with his son Giovanni (born 1245; died 1321), he was a close student of this Greek work. His son, although less great, may be called a true artist. He too often sacrificed harmony and charm to expression and action.

Following him comes the wonderful Giotto (Angiolotto, born 1276; died 1336), pupil of Cimabue. He modeled the reliefs upon his beautiful campanile in Florence. He was greater as a painter and architect, however, than as a sculptor. He was a friend of Dante, a copy of whose portrait, painted by him, may be seen upon the walls of the Bargello, in Florence, to this day. His influence upon Italian art was unbounded.

Andrea Pisano (1305–1359) did work in sculpture similar to that of Giotto, but worse rather than better. He was one of the first to abandon the Gothic style and adopt the models of ancient Greece. Now comes Orcagna (Andrea di Cione — born about 1325; died 1376), who, with his marvelous creative genius, and his chaste and simple style, surpassed all his predecessors. His masterpiece is a shrine, in Or' San Michele, in Florence, to the Madonna,— comprising reliefs depicting her life, cut out of white marble. He reëstablished the laws of perspective, and was great as an architect and fresco painter as well as a sculptor. He was the author of the famous frescoes in the Campo Santo at Pisa.

Donatello (1383–1466) adds another great name to art, a name of rare and original genius, the crowning qualities that make up the idealist and realist in happy fusion. He was famous for his low reliefs, which are now scattered throughout the world. He was remarkable for his power and truth of expression; his character was noble and generous. His best known statues are those of St. George and St. Mark, on the outside of Or' San Michele, in Florence. He was a lover of children, with a rare faculty for catching their illusive forms.

Lorenzo Ghiberti (1378–1455) came now to create and execute the famous gates of the Baptistery at Florence, upon which he spent twenty years of his life, and which Michael Angelo declared to be "fit for the gates of Paradise," but which, however beautiful, tend to the degradation of sculpture into the picturesque, rather than to its elevation into the purely sculpturesque. His style was

graceful, dignified, and harmonious. In his own day he was famous, and his fame has lost nothing in five centuries. Ghiberti's successor was Sansovino (1460–1519), who carried on the even, harmonious, serene style of his predecessor.

Now comes a change in Italian art, whose foundations are splendidly shaken as Michael Angelo steps upon the scene. Michael Angelo Buonarotti (1474–1564), trained thoroughly in the technique of his art, was a lover, all his life, of the antique. His style is vigorous to the point, sometimes, of exaggeration. Into all his marbles he breathed his own passionate, turbid, intellectual, poetic nature. He loved devotedly his native city, Florence, and fought in her defense until the downfall of her liberties. The tyrant who came after him had sufficient wit to value and conserve his art, although destroying all from which it arose. His sculpture is tragic, terrible, never to be forgotten when once seen, not unlike his lonely, ascetic life. He was greater as a man, perhaps, than as an artist, full of sweet thoughts and great tenderness. His is altogether the greatest and most interesting name among the Italian sculptors. He touched life on every side. His Moses is perhaps his greatest work. What lessons of tireless energy and unswerving purpose are to be learned from it! He sacrificed ideal beauty often to his intense love for expression and dramatic action. The "Night" and "Dawn" on the tombs of the Medici at Florence are incarnations of despair, resistance, and endurance. The Lorenzo de Medici is full of steady resolution and lofty thought and purpose, power in repose, latent force, concentrated life. It is the intensity of these conceptions, their terrible seriousness, that saves them from the bane of realism. The sweet, sad resignation of the Madonna della Pietà in St. Peter's exhibits the delicate and tender side of his genius, too often overridden by his desire for fervid expression. His chief fault seems to have been impatience. Many of his works were ruined by his chipping off a piece too deeply in

his impetuosity. His impatience led him often into exaggerations. Those who studied with him copied his faults, but failed of his genius. He had many imitators, but no worthy successors. His greatest work, as a painter, is the decoration of the ceiling of the Sistine Chapel in Rome.

Some of his contemporaries, however, are worthy of mention, notably Benvenuto Cellini (1500–1570), whose autobiography is well worth reading, and who made the famous Perseus. He was given to affectation at times, and was over fond of detail. He excelled in gold-working and engraving. His medals have won universal admiration. His style was graceful and charming, rather than grand.

John of Bologna (1524–1608) shows more power than Cellini. Many critics have pronounced him second only to Michael Angelo. He was a friend of that master and one of the first members of the Academy of Florence. His best known work is the "Flying Mercury" in the Bargello at Florence. He received his name from the famous fountain which he built at Bologna, with a colossal figure of Neptune. His style was gay and spirited.

Sansovino (Jacopo Tatti, 1479–1570) has left much interesting work in Venice, where he settled, although a Florentine by birth. His style tended rather to exaggeration. His masterpieces are the four Evangelists in the chapel of St. Mark's and colossal statues of Mars and Neptune in the Doge's Palace. He displayed also much talent as an architect.

The inordinate striving for expression, which now prevailed, brought about a quick decadence in sculpture. Here and there are single works that show that the great style was not entirely lost. The beautiful statue of St. Cecilia lying dead, at Rome, was done by Stefano Maderno (1576–1636). This was his only fine work. His contemporaries did nothing as fine, and little above the commonplace.

Among the famous sculptors of this era were the Della Robbias: Luca, Andrea, and the sons of the latter. Of these, Luca, born 1390 or 1400, was the eldest and the most famous. His bassi-rilievi, adorning the campanile of the cathedral of Florence, are still seen and much admired. Perhaps his most famous work is the sculptures in relief designed for the front of the organ-gallery in the Duomo at Florence. This work, in high relief, represents groups of boys and girls, youths and maidens, singing, playing upon instruments of music, and dancing. In every group are a charming freedom of action, grace of attitude, and elegance of flowing drapery that are unsurpassed. Andrea della Robbia, a nephew and pupil of Luca, and scarcely less famous, was born in 1435. Simone, a brother of Andrea, was also a sculptor of some note, and of the seven sons of Andrea, five followed his profession. The reliefs and statues of Andrea della Robbia are found all over Europe. Many of his works may be seen in the church of Santa Maria delle Grazie, the convent of Vernia, and in many of the churches of Italy. Two of the sons of Andrea, Paolo and Marco, became members of the Dominican order of monks under Savonarola, and added to the artistic fame of the order.

The work of the Della Robbias is characterized by its lofty purity and almost Greek simplicity of style and treatment, to which artistic virtues we may add that of a distinctively tender quality.

Spanish Art. — Spain has produced greater painters than sculptors. Good work has been done in wood-carving, and much is decorative. Two men have been famous, Alonzo Berruguete (1480–1561) and Gasparo Becerra (1520–1570). These both were pupils of Michael Angelo. The first restored the Alhambra and executed important works at Madrid. His masterpiece was the choir of the cathedral at Toledo. The second executed the famous statue of the Virgin at Madrid. The Spanish learned their art from the Italian masters.

Their school is characterized by strong effects of light and shade, making their art fervid and dramatic. Most of all did they care for expression. One sees the effect of their religious training in the severity and passion of their art. The nude is seldom met with. Their madonnas and saints breathe an air of enthusiasm and devotion that fascinates the beholder.

The Modern Era: German Sculpture. — Byzantine influence continued to dominate German art until the twelfth century. In Cologne and the Rhine provinces creditable work was done in toreutic sculpture. On a font at Liège are some remarkable reliefs, baptismal scenes from the New Testament, by Lambert Patras of Dinant. These were executed about 1112. They display a certain crude beauty.

In the Merseburg Cathedral is a figure of Rudolph of Swabia in bronze, interesting because of its realistic treatment. In the Hildesheim Cathedral is a choir-screen executed in stucco, and once gilded and colored, a series of large reliefs broadly handled, noble in conception, and draped with true classic feeling. This is one of the finest pieces of twelfth century sculpture.

During the thirteenth century Germany did not attain as great a distinction in sculpture as France. The golden gate of Freiburg cathedral, however, displays progress. The sculptured figures on the jambs are cleverly executed. French influence may be clearly traced in these works (1270). There are also statues of the apostles upon the pillars of the nave, and one of the madonna at the east end, which display singular breadth and beauty.

At Bamberg, in the market-place, is an equestrian statue of Conrad III, resting on a foliated corbel. This shows originality and virile power, and is designed with a remarkable knowledge of artistic effect.

At Brunswick, of the same period as Conrad III, are to be seen two fine statues, dignified and beautiful in expression, representing Henry the Lion and Queen Matilda.

Some of the finest sculpture of the thirteenth century is to be found in the cathedral at Strasburg. A "Death of the Virgin" (a tympanum relief), surrounded by sorrowing apostles, is a work of wonderful beauty, in advance of the period. Of its kind the decorative carving is as fine as any extant. The foliage is studied with the greatest love of nature, and is carved with the joy of devotion to chosen work.

Nuremberg is rich in sculpture of the fourteenth century. St. Sebald, the Frauenkirche, and other churches are decorated with statues and reliefs that, taken as a whole, produce upon one a feeling of richness.

The fountain of Heinrich der Balier of this epoch is richly decorated with color and gold, and adorned with statuettes of noticeable beauty. In the museum at Augsburg may be seen several large statues carved in wood, exhibiting nobility and dignity of treatment. This town produced a number of able sculptors of whom she is justly proud.

On the exterior of the choir of the church of Marienburg Castle is a remarkable colossal figure of the Virgin, built of hard stucco and adorned with mosaics of glass.

At Prague, in the market-place, is an equestrian group in bronze of "St. George and the Dragon," which is well executed and vigorous, but defective in style. In the Cologne cathedral is a fine statue in bronze of Archbishop Conrad, noble in style and evidently a good portrait.

The military portrait statues in Germany, and indeed everywhere, of this time, were stiff and lifeless of necessity, being disfigured with plate armor. The ecclesiastical chasuble which was also much used does not lend itself to plastic representation.

The fifteenth century produced many artists of marked ability. Much excellent work was done in the decoration of wooden altars with

statues and reliefs. The work of this century seems to have been largely in the order of church decoration. The choir-stalls in Ulm cathedral, dating from about 1474, were executed by one Jörg Syrlin, probably the ablest sculptor of the epoch. Wohlgemuth (1434–1519) under whom Dürer studied, was a wood-carver of no mean ability. Dürer executed in boxwood many reliefs of great interest.

Another distinguished sculptor of this time was Adam Krafft (1455–1507). The great Schreyer monument at Nuremberg was executed by him. This monument is criticised because of its mannered style and pictorial, rather than sculpturesque, effect. He produced also the great tabernacle, eighty feet in height, for Ulm cathedral.

We now come to the famous Vischer family of Nuremberg, which produced the ablest sculptors perhaps of the fifteenth and sixteenth centuries in Germany. Hermann Vischer still clung to mediæval traditions. Peter Vischer, the son of Hermann, was the chief artist of this family. Few sculptors of bronze have ever excelled him in technique; his style, however, suffers from the mannerisms and realistic tendencies of the day. He lacked moderation. The splendid shrine of St. Sebald with its luxuriant decoration is by him. It is a marvel of fine and delicate workmanship. Its slender, graceful columns are very beautiful. He was assisted in his work by his sons. The general design is Gothic. Every available space upon the canopy and its supports is covered with carvings of dragons, foliage, and grotesque figures. Time and labor were given unstintingly.

After Nuremberg, Augsburg is perhaps the chief centre of bronze sculpture. In a quaint church of Innsbruck is a series of bronze statues, twenty-eight colossal figures, surrounding the tomb of the Emperor Maximilian, and representing his ancestors. The finest figure of the collection is undoubtedly an ideal statue of King Arthur of Britain, of noble mien and excellent pose.

During the latter part of the sixteenth century is clearly seen the influence of the later Italian Renaissance. The sculptors are biassed by the style of Giovanni di Bologna. The seventeenth and eighteenth centuries in Germany were periods of swift decadence in sculpture. Some good portrait figures were produced, but no monument of any artistic value. A strong revival is noticeable in the latter part of the eighteenth century, and since then Germany has produced much sculpture of little real value. It is great in point of size, but is lifeless in conception and feeble in execution. One may class it with much other pseudo-classical sculpture of the century. The work of Rauch (1777–1857) has been praised beyond its merit. His recumbent statue of Queen Louise at Charlottenburg is sentimental and mannered. He seems to have been the best known man of the epoch. Albert Wolff shows a more virile power. Augustus Kiss (1802–1865) produced the famous "Amazon and Panther" bronze-group in the court-yard of the royal palace at Berlin. This sculptor wrought only in bronze and other metals. The sculptor Rietschel displays more ability than any of his contemporaries. A man who has achieved more reputation than he deserved was Schwanthaler (1802–1848). He is the author of the colossal bronze statue of "Bavaria," second in size only to the liberty statue by Bartholdi. He was patronized by King Louis of Bavaria. In our own immediate time German sculpture has thrown off its weak conventionalities, and shown decided vigor and individuality.

Modern Italian Sculpture. — The eighteenth century produced no men of great genius in Italy. We find, at Naples, Corradini and Sammartino producing many statues devoid of any sculpturesque worth. Art was lost in artifice. A deceptive realism had taken the place of the noble art bequeathed to Italy by Michael Angelo and Donatello. The middle of the century inaugurated the classical

revival which was destined to spread throughout Europe. The leading figure of this movement was Canova, the most popular sculptor of his time. He aimed at a classical perfection, which Greece had achieved once and forever. His work had a certain grace which was trivial rather than noble. His finest group is that which represents "Theseus slaying the Minotaur," now preserved at Vienna. He achieved distinction for his monument to Pope Clement XIII, in St. Peter's at Rome. The lions here are strongly modeled, but not with the sure knowledge that Barye and other French sculptors have since brought to animal sculpture. His tomb to Titian at Venice is entirely pictorial. Posterity has assigned to him much less fame than that given during his own time.

Certain critics have called Bastianini of Fiesole truly great. His style is that of the famous Florentine sculptors of the fifteenth century. Indeed, some of his work has actually been sold as veritable fifteenth century production.

The leading sculptors in Italy to-day are Vela, author of the "Dying Napoleon," of world-wide repute; Monti, whose technical ability has gained him some distinction; and Rossa, of rather too florid style. One cannot apply the adjective great to modern sculpture in Italy. It is a transitional period with the Italian people, and their art exhibits this lack of poise. A criticism that may be made upon it all is, that it is picturesque and trivial, rather than sculpturesque and dignified.

French Art. — When Gaul became France under Clovis, ignorance and bad taste were so universal that, if creative genius in sculpture existed, it was not permitted to come to the surface. At the beginning of the eleventh century, the dreaded year 1000 having passed by in safety, the art of sculpture appeared in France. The influence of the crusades is seen in the religious edifices, and in the rude sculptures belonging to the age of St. Bernard. Little by

little French sculpture threw off the Grecian and Byzantine influences in which it had originated and became Gothic. There is little use in lingering long over the thin, dry, and suffering figures produced by the early sculptors who were mostly monks. The early spirit was hostile to the study of the nude, and indeed to beauty itself. It was virtue, and not beauty, men demanded. They had not spiritual insight sufficient to recognize that true beauty is one with virtue. Shoulders and hips were forbidden to be represented, and the hands must be always folded in meditation or prayer. Expression was sought through grimace or contortion. The Christian of that day evidently attempted to supply the interdicted beauty by strained expression. Early French art is utterly devoid of that calm moderation and sweet beauty which made the Greek art so lovely and enduring. The sculptors were in accord with the prevalent ideas of their time. Art reflected the state of society.

Through the twelfth and thirteenth centuries we find sculpture becoming more secular. It has passed from the hands of the monks to the care of the bishops, and these bishops were less subject to the Pope than the monks, strange as it may seem, and permitted a greater variety of subjects to be represented in sculpture. Old legends were abandoned for New and Old Testament subjects.

Some groups of great interest were now produced, and an actual Renaissance was dawning for France. The artist's liberty became more and more wide. The work of the time shows not only a democratic tendency, but a true classic feeling in choice of attitude and arrangement of line. The artists of this time seem to have known the laws of sculpture. Their statues and reliefs are well adapted to the positions they occupy. The sculpture of this epoch is entirely decorative and cannot be separated from architecture. The Christian cathedral was a representation, in a way, of the world, and as artists freed themselves from priestly interference, the cathedral became a picture of the universe. Anything

may find representation in it — men, demons, angels, gods, plants, symbolical subjects, dragons, and anything that the fancy may conceive or the eye actually see. The cathedrals of Rheims, Chartres, Amiens, and Paris, are decorated according to this idea. In the fourteenth century we have the names of Jean Ravi and his nephew Jean Bouteiller, sculptors who worked together upon a life of the Virgin in relief about the cloister of Notre Dame in Paris.

Michael Colomb (1431–1514) executed many notable works. One of the rooms in the Louvre bears his name. He is the author of a famous bas-relief representing the struggle between St. George and the dragon. It is spoken of as a work of great delicacy of handling and boldness of conception, and quite worthy of Italy at that fine period of her Renaissance.

Jean Juste of Tours executed a tomb of Louis XII that has made his name known to us, and Jean Texier, by his forty-one groups in the Chartres cathedral, has become famous. David said, "It is Raphael himself, as seen in the loggia of the Vatican." Two famous tombs in the same room as the alabaster statue of Louis XII, which show careful chiseling and fine feeling, are the work of unknown men. They are preserved in the museum of the Louvre because of their native simplicity, and show the state of French art before it was changed by Italian influence.

We come now to the famous name of Benvenuto Cellini, invited to France by Francis I. It was now that the French imbibed the grand style of that masterful Italian school; and a French sculptor, John of Bologna, was destined to become famous among Italian sculptors. His work has been described elsewhere.

And this brings us to Jean Goujon (1530–1572). This name is famous in the annals of French sculpture; he has been called the French Phidias. His "Deposition from the Cross" is now in the Louvre. Upon the "Fountain of the Innocents," a most beautiful

conception, which was designed by Lescot in 1550, are nymphs of ideal beauty, with long and subtle figures. These nymphs, with their water-jars, have been often reproduced and sent over the known world. Jean Goujon has been called the restorer of sculpture in France. Others, again, have given him the title of creator of French statuary. He is supposed to have been born about 1530.

Germain Pilon (1515–1590) was an energetic, skilful sculptor; he executed the tombs of Francis I and Henry II. The Louvre contains a collection of his works. A famous group by him represents three women supporting a gilt vase, which was intended to contain the hearts of Catherine de' Medici and Henry II. The group is known as "The Graces."

For a long time French sculpture appears to have been employed chiefly in the decorations of tombs. Jacques Sarrazin and Pierre Puget (1622–1694) are distinguished names. The latter, in particular, is said to have resembled Poussin in his enthusiasm for independence and beauty of character. Like Poussin, Puget became disgusted with the gilded slavery of the court life and with inspectors of fine arts, and gave himself up to solitary study. He was painter and architect, as well as sculptor. He has been called the French Michael Angelo. He was original, but eccentric, giving himself over to his moods as a guiding genius. Like Michael Angelo, he often attempted to work directly in marble, without any previous sketches. He lacked taste and knowledge of the antique. One of his famous groups is the "Milo of Crotona devoured by a lion." Wonderful are the action and life of the figure, and the finished execution. The group has been said to rival the famous "Laocoön." It is considered the masterpiece of Puget. No work was too difficult or too complicated for his genius. He seems to have lacked a calm sense of proportion and moderation. His last group was that of "Alexander and Diogenes," finished at the age of 74. His old age was, like that of Michael Angelo, productive and laborious.

The work of Antoine Coysevox (1640–1720) resembles that of Puget. He was the author of the Mausoleum of Cardinal Mazarin, and many busts, notably those of Pierre Mignard and Charles Le Brun, said to be good portraits, and certainly creditable works of art. The two brothers, Nicolas and Guillaume Coustou (1658–1735), produced, the former, the group in the Tuileries garden, known as the "Junction of the Seine and Marne," and the latter, that of the famous riding-masters of Marly, now placed at the entrance of the Champs Elysées. A single work by certain sculptors has rescued their names from oblivion, such as "Leda and the Swan," by Jean Thierry (1669–1739), the "St. Sebastian at the Pillar," by François Coudray, and a "Hercules vanquished by Love," by Joseph Vinache. "Prometheus and the Vulture," by Nicolas Sebastian Adam (1705–1778), is a powerful piece of work, and, last is a "Charon," remarkable for its gloomy and reserved strength, whose author's name, alas! is unknown.

In the room of the Louvre devoted principally to Edmé Bouchardon (1698–1762), containing mostly works of the eighteenth century, the florid and effective style of the era is everywhere visible. The style of this sculptor is correct and large, but it lacks fire and enthusiasm. The statues of Christ, Mary, and of eight apostles, which adorn the church of St. Sulpice, are worthy of attention, as well as the sculptures of the Rue de Grenelle fountain. A pleasing statue by this sculptor is that of a young girl holding a stag by a cord, in the Louvre; the graceful attitude, the lovely head, and delicacy of the execution in the whole work, recall the antique in in many ways. In the same room which bears Bouchardon's name, is a "Psyche" by Augustin Pajou (1730–1809); upon the pedestal is the following inscription, "Psyche lost Love in wishing to know him." His wit seems to have been greater than his genius. The statue may be classed as a poor affair. Some of his busts, however, have won distinction for him, notably the lifelike portrait of Buffon.

We come now to the room named after Houdon, which contains not only his work, but that of many of his contemporaries. Jean Antoine Houdon (1741–1828) is one of the great names in the history of French sculpture. His best work, perhaps, is to be seen in the Théâtre Français, rather than in the Louvre. His bust of Molière, in the lobby, and the famous statue of Voltaire, in the vestibule, have won for him enduring reputation. He has combined, with rare tact and true poetic insight, the real with the ideal. The keen, individual, fox-like expression of Voltaire is softened by something which makes us love the old atheist because of his love for humanity. We remember, as we look at this seated statue, that he was wont to dole out soup to the poor and hungry from his own doorstep. Another statue that we must make mention of is the charming "Diana," represented entirely nude. The style is pure and graceful; she is represented not at all as a Greek Artemis. The modern French idea of that chaste goddess is much less dignified and nobly beautiful than the one the Greek entertained.

There is a reclining statue of "Byblis, changed into a fountain," by Charles Dupaty (1775–1825), which is lovely in its contour and conceived with true sculpturesque feeling.

The works of the men who have lived into our own time have been preserved, many of them, in the Luxembourg. M. Antoine Louis Barye (1795–1875) is represented by his bronze group of a jaguar devouring a hare. This group was cast by the lost wax method, in one mould; a process that is coming into general use again, and one which was in great favor with the artists of the Italian Renaissance. M. Barye won distinction, especially in the line of animal representation, and was undoubtedly among the first sculptors in the world. His group of a lion devouring a boar, in the Tuileries garden, is known to us all by the small copies of it sent to this country. Barye was a most conscientious and untiring

student of nature. He lacked, however, the necessary ideal qualities and represented literal facts.

Another great sculptor in the present French school is M. Emmanuel Frémiet, born in 1824; he is the author of the famous equestrian statue of Joan of Arc in the Rue de Rivoli. The horse in this group is considered by many animal sculptors to be the finest in existence. All the sculpture by this eminent artist is wrought out with artistic feeling and wonderful technical skill. Another interesting figure in the hall of the Luxembourg is the "Virgil," by M. Thomas, a professor in the École des Beaux Arts. All that this refined sculptor has executed is worthy of our study. His work is more calm perhaps than that of any other Frenchman, and nearer to the Greek spirit. It is always moderate, and its pathos is the pathos of all great art. The work reflects the man's character, honest, simple, thorough, high-minded, and noble. François Rude we know best by his group of the Marseillaise, a vigorous high-relief on the Arc de Triomphe at the head of the Champs Elysées. This group is modeled with tremendous power, but it leaves upon the mind the impression of uncouthness. Another famous statue is the Spartacus, by Foyatier, in the Tuileries. Pradier, who died in 1852, has left good work in his "Fontaine Molière" in the Rue Richelieu. A great man we must not forget is Pierre Jean David, known as David d'Angers (1789-1856), the author of the pediment of the Pantheon, and of the Lafayette at Washington in our own country. This artist combined with great artistic gifts a noble mental endowment and an independent spirit, and like Poussin and Puget, has left the record of an almost stainless life. We may mention names of men who are famous to-day, notably those of Paul Dubois, and the even, refined, and classic Chapu, as well as Guillaume Perraud, Carpeaux, author of the group of dancing girls which adorns the Opera House, Aimé Millet, and Falguire, who has made many "Dianas" which are

Dianas merely in name. This artist is as skilful in the mechanics of sculpture as any man in France, not excepting Rodin. Neither the one nor the other has produced work which is large enough in its conception, and sculpturesque enough in its treatment, to be called great; still in France they are reckoned as the leading sculptors of the day. Our standpoint is different.

The present school of sculpture in France is by far the most important in the modern world. Intimate knowledge of human and animal form is combined with complete technical skill. The sculptors of the Praxitelean age exhibit less technical knowledge than do these clever Frenchmen. At times the French school displays force as original genius: alas, that they should be dominated as they are, and over-ridden in life as well as art, by a debasing, sensual realism! Realism is carried so far that often their statues are nearly exact copies of nude models. French life demands this literal and voluptuous expression. Their sculpture is not monumental and their last effort, called "A Memorial to Gambetta," "out-Herods Herod." It is perfervid to the point of nausea. The sculptor of this clumsy nightmare has not learned one limitation of his art. As a general criticism, one may say French sculpture as well as architecture goes too far. It lacks the quiet restraint that is characteristic of the great schools of Greece and Italy. Their splendid technical qualities and consummate knowledge of anatomy make this lack of idea and moderation more palpable. When the life of France is different we may hope for works of art that are worthy of the clever technique that distinguishes the carvings of her artists.

English Sculpture. — The west front of Wells Cathedral is covered with figures carved early in the thirteenth century, before Niccolò Pisano had cut his wonderful pulpit at Pisa, and many years before the beautiful cathedral of Amiens was built. It is believed that the men who did the interesting work on the cathedral in

England were Englishmen. We are told, moreover, that Edward I caused "stone crosses of magnificent architecture, adorned with statues of the departed queen," to be erected wherever the body of his beloved wife, Eleanor, stopped on its way to Westminster Abbey. A certain William Torell carved the figure of a king for Henry III's tomb in Westminster Abbey, and executed three recumbent statues of Queen Eleanor about the year 1291. These facts are interesting, because they show us how early Englishmen did work in sculpture in their own country.

The cathedrals and churches built in the thirteenth and fourteenth centuries show many examples of carving of a historic or religious character. Over the steps of Henry VII's chapel, upon the arch, are to be seen fifty or more statues. On the north side is a coronation of Henry V; while on the south face is an effigy of the king, fully armed, mounted on his horse and riding with his companions at full speed. Flaxman speaks of this sculpture as being bold and characteristic. Again, in St. Mary's church, Warwick, may still be seen an effigy of Richard Beauchamp. It is a gilt bronze figure on a marble pedestal, praying, and is the work of William Austen of London. About it are other small bronze statues in niches.

Pietro Tourgiemo of Florence, the sculptor who is said to have given Michael Angelo, in a fit of jealousy, the blow that broke his nose, came to London to make the tomb of Henry VII; and it is recorded that he remained there six years. Henry VIII ordered him to make the most magnificent sepulchral monument possible. Some design was prepared, but the monument was never executed. In 1538 Henry VIII made a proclamation that all images which had been worshiped should be taken down from the churches; and during the minority of Edward VI, the Duke of Somerset who, as regent, had assumed the title of Lord Protector, ordered all images without regard to character or meaning to be thrown down.

It was then a dark age for sculpture in England, and no revival occurred until Charles I came to the throne. The first true artist of the English school was Grinling Gibbons (1648–1721), whose wonderful carvings in wood are still to be seen at Windsor Castle, in the choir of St. Paul's, and in other places. The author of the tomb of General Wolfe in Westminster Abbey was Joseph Wilton. He inaugurated a style which, it is said, Flaxman afterward perfected. From 1740 to 1799 lived John Bacon, who made the busts of Dr. Johnson and John Howard in Westminster Abbey. He was a man of no mean ability.

Thomas Banks (1735–1805) is declared by Scott to be the father of ideal sculpture in England. He first studied wood-carving and afterward entered the Royal Academy, where he won the gold medal which entitled him to three years study in Rome. He devoted his time to the study of the antique, which influenced his style not a little. He returned to England, to find but scanty appreciation, and left, disappointed, for Russia, where he remained two years. Catherine II is said to have bought one of his statues and a bas-relief of much merit. A model for a figure of "Achilles Mourning for his Briseis" is preserved in the British Institute. This sculptor of eminent ability had the misfortune to come before the people were ready for him. His life was one of hard disappointments. His enthusiasms were chilled, and his poetic genius was stultified, for lack of sympathy.

Joseph Nollekens (1737–1823) did some mediocre portrait busts, — "pot-boiling" work, which the more highly organized Banks despised; and, while Banks could hardly make a living, Nollekens amassed a great fortune.

John Flaxman (1755–1826), who is said by eminent English critics to have made the English school of this century, learned his art in the shop of his father, who was a maker of plaster casts. The advantage which he enjoyed in boyhood of seeing the reproductions

of whatever sculpture was current, produced its effect in after life. At eleven and a half years of age he gained a prize for modeling, and at fourteen was admitted to the Royal Academy. In 1787 he went to Italy, where he remained seven years under the same influences that had formed the genius of Thorwaldsen and Canova. In Rome and its environs, and about Naples, Greek statues and fragments were being found. An enthusiasm for antique work arose, as it did in the best days of the Italian Renaissance. Antique sculpture had a powerful effect upon Flaxman, and led to the formation of that severe and simple style for which he has been distinguished. His "Shield of Achilles," modeled after the description given by Homer, is a fine piece of work. Among his other famous pieces are an "Apollo" and "St. Michael and Satan," done for the Earl of Egremont, and the frieze for the front of the Covent Garden Theatre. Some of his most charming work is found in the bas-reliefs upon the Wedgwood pottery. He also designed vases of exquisite form. In 1810 he was made Professor of Sculpture at the Royal Academy. Here he gave lectures in art every year during the remainder of his life. His outline designs in illustration of Homer and Dante have been admired by all the world.

Edward H. Bailey (1788–1841) was a noted pupil of Flaxman. He is the author of the "Nelson" on the column in Trafalgar Square. A man who gained name and fame for his portrait sculpture was Sir Francis Chantry (1788–1841). He, like Thomas Banks, began life as a wood-carver. In 1803 he entered the Royal Academy, and in 1809 had won fame for his statue of George III. In 1819 he went to Italy; in 1835 he was knighted. A group by him in Litchfield Cathedral is much admired. A statue of Lady Louisa Russell good critics have called beautiful.

We come now to Sir Richard Westmacott, a pupil of Canova (1775–1856). His works were, for the most part, monumental. He did the monuments to Pitt and Addison in Westminster Abbey, and

to Sir Ralph Abercrombie in St. Paul's. He also executed a bronze statue of George III in Windsor. In 1816 he succeeded Flaxman as Professor of Sculpture.

Richard Westmacott (1799–1872), son of Sir Richard, was scarcely less famous. He was the pupil of his father, and afterwards studied in Italy. He was elected fellow of the Royal Society in 1837, and of the Royal Academy in 1839. In 1857 he became Professor of Sculpture in the Royal Academy. His works are chiefly classical and devotional in their character. His "David," as the slayer of Goliath, and his "Cymbal Player," are noted examples of his work. He achieved distinction also as a writer upon art topics.

John Gibson (1791–1856) was also a pupil of Canova, and afterward of Thorwaldsen. He passed the greater part of his artistic life in Rome. Like many of his predecessors, he studied wood-carving in his youth. In 1817 he went to London as a portrait sculptor, and in the same year, when he was twenty-six years of age, he went to Rome. On his return to England, in 1844, with the statue of Huskisson, he was greeted with the warmest enthusiasm, and was invited to visit Windsor, where he executed a statue of the Queen. His life in Rome was simple and generous, and he was widely known and respected. His only pupil who has achieved distinction is Harriet Hosmer. Some of his famous works are "A Hunter and his Dog," "Narcissus," in the Royal Academy, "Psyche borne by the Zephyrs," now in Rome, and his "Wounded Amazon." Gibson favored the practice of painting statues, an idea which was much opposed by many, and his tinted "Venus" was widely criticised at the time of its execution. There is no doubt that this idea did great harm to sculpture, by creating a desire to add to pure form a meretricious, realistic accessory, the office of which in sculpture was not understood.

John H. Foley (1818–1874) attained considerable reputation for his groups and portraits. He was made an academician in 1858.

Among his famous works are "The Youth at the Stream," "Ino and Bacchus," and "Venus rescuing Æneas."

There are many English sculptors of talent to-day, although the climate and conditions are unfavorable to the highest development of this art. The greater portion of them have been students in France and Italy. These may be mentioned: Patrick McDowell, author of the "Europe" on the Albert memorial; Alfred Stevens, the creator of that wonderful piece of decorative sculpture in St. Paul's, the monument to the Duke of Wellington; John Thomas, who has done some fine sculpture in the new houses of Parliament. Mention should be made of Joseph Edgar Boehm, who, although born at Vienna, has lived and worked chiefly in England. He has been held in high esteem by the royal family, and has executed many works for the government. One of his most interesting statues is that of Carlyle.

Names of sculptors often mentioned to-day are those of Gilbert, Thornycroft, Gebhart, and Onslow Ford.

Russian Sculpture. — The Russians are developing an important school of sculpture. It has the saving grace of originality. Whatever may be said of it, it is not a weak following of French art; vigor and dash characterize all the art efforts of this brilliant people. In depicting animal life they are especially strong. Pio Welonski, now working in Rome, is one of their representative men. Marc Antocalsky, residing in Paris, is a man whose work has a strong individuality. This sculpture of Russia lacks a certain humanizing quality which is essential to a lovely and rounded art. Mention should be made also of Martos, Halborg, Orlovsky, and Tchizhob.

Flemish Sculpture. — In Holland little has been done in the art of sculpture. Nature has provided no ready or suitable materials; no sculptor has arisen to rival in any degree the splendid art of

Rembrandt, the great painter. What statues and monuments we find in the museums, public squares, or halls of Dutch towns, are for the most part the work of foreign artists, so we may pass from Holland to the school of Flanders. It is in the picturesque city of Bruges that we find the best proofs that sculpture was practiced in Flanders contemporaneously with her great art of painting. Two of the most famous works in that city are to be found in the church of Notre Dame ; they are the tombs of Charles the Bold and his daughter, Mary of Burgundy. The effigies are in gilt copper, and repose upon black marble slabs. The carving of the drapery and accessories is wonderfully delicate and chaste. They are remarkable chiefly for the fact that they exhibit an execution that could hardly be excelled to-day.

In the Palais de Justice, in the room where the juries are wont to deliberate, is a famous chimney-piece of carved wood, of which a cast is shown in the Louvre in Paris. It is thought to have been executed by Hermann Glosencamp, who, having been condemned to death, asked leave to execute one last example of his handicraft. By profession he was a wood-carver. He produced, with the aid of his daughter, this most wonderful and beautiful mantel-piece, which not only saved his life, but obtained for him a full pardon. The statues which adorn it are of nearly life-size. In the centre Charles V is represented, holding in one hand a sword and in the other a globe. On his right is a statue of his illustrious grandfather, Charles the Bold, and on his left are portrait statues of Mary of Burgundy and Maximilian of Austria. The space between these statues is filled with a variety of ornaments, cupids, spirits, armorial bearings, etc. The work is considered a masterpiece of composition, and is greatly admired for the delicacy and beauty of its workmanship. It is not to be wondered that the sculptor was granted his life.

In the Museum of Dijon, among others, is a work by a Flemish

artist, a tomb of the Dukes of Burgundy, Philip the Hardy, finished in 1404. We know this to be the work of a sculptor named Claux Sluter, who was assisted by his nephew, Claux de Vousonne, and by Jacques de Baerz, all three of whom served the Duke of Burgundy. Between this age and our own time there is little work of sufficient interest to warrant comment. In our own day may be mentioned Geefs, Fiers, Sopers, and Wiener, who have attained eminence in sculpture.

The work upon the tombs to which allusion has been made is as delicate and beautiful in many cases as the work of the early Italian Renaissance.

American Sculpture and Sculptors. — The art of sculpture with us has followed the natural order of development; that is, it has come only after the necessities of life have been provided for, and some time after the love of painting has been developed. Considerable interest has been manifested in architecture, and particularly in that classical phase of it which we have termed colonial. The fact that the material from which sculpture is cut, viz., marble, is expensive, and has to be brought from Italy, accounts partially for the lack of fine sculpture in our country; but it is more easily accounted for by understanding thoroughly the conditions of life which engender and develop a love for pure form. These conditions have not long existed in America. That they do exist in part to-day, has been shown in an article published elsewhere, entitled "An American School of Sculpture."[1] As early as 1784 we have notice of a Mrs. Patience Wright, born at Bordentown, N.J., 1725, who achieved some success at home, and made for herself a reputation in England as a sculptor. She made likenesses in England of the king and queen, Lord Chatham, and others. She died in 1785. A year before her death there is mention of a statue in wax of Lord

[1] *Art for America.* Boston: Roberts Bros.

Chatham, size of life, standing in a glass case in Westminster Abbey. We must admire her and pity her, when we consider the unfortunate accident of her birth, in an atmosphere not tempered to the artistic genius, and the lack of early instruction. We must admire her for having achieved anything under such hard circumstances. When Mr. Adams was minister at the court of St. James, Mrs. Adams described in an interesting way a visit to Mrs. Wright's studio. Her modeling was done, for the most part, in wax.

At this time, we already had famous painters, such men as West, Trumbull, and Stuart, while Mrs. Wright seems to have been the only American who had achieved any reputation in sculpture. The arrival of Houdon in 1785 from France, whom Jefferson and Franklin persuaded to come to this country to make a statue of Washington for the State House at Richmond, marked an era for American lovers of art. The head of Washington was modeled directly from life, at Mount Vernon. Mr. Madison was present at many of the sittings. From this statue, which is still in existence, and the excellent painting of his head by Stuart, we may form a just conception of how Washington looked. These portraits were universally admired in their day. Houdon's cast is common enough in France as well as in America, and is an excellent piece of work, though not as big and magnanimous a representation, nor as satisfactory, from an ideal standpoint, as is that made by our own sculptor, Crawford, the father of F. Marion Crawford, the author. This visit of Houdon had a beneficial effect, in agitating in society a desire to know more of, and to own, good works of sculpture. In 1789 came to America a certain John Dixey, who practiced ornamental stone-cutting and wood-carving. We hear of him as the vice-president of the Pennsylvania Academy of Fine Arts, in 1810 or 1812.

William Rush (born in Philadelphia in 1757, died in 1833) achieved distinction as a modeler and as a wood-carver. The

second foreign sculptor of any importance who visited America was Giuseppe Ceracchi, known in France and England. He had worked with Canova upon the Pantheon in Rome. He arrived in this country in 1791, and did his best to awaken an interest in the fine arts. He was interested with William Rush and others in the plan for the Academy of Fine Arts in Philadelphia. He wished to build a great monument; but Congress failed to appropriate the necessary funds. Before he left this country he executed several interesting busts, notably those of Alexander Hamilton, Washington, Jefferson, Paul Jones, John Jay, and others. When we consider that he was here but four years, the amount of work he accomplished is remarkable; and his portrait busts are cherished with great care, as they have brought down to us the countenances of some of our greatest men. His work smacks of the pseudo-classical school of Canova. His after-history was melancholy. He joined those in France who were interested in the French Revolution, and on a charge of being concerned in a plot against the first Napoleon, he was guillotined in 1801.

In the rotunda of the Capitol is a bas-relief signed by N. Gevelot, 1827. The subject is Penn making his treaty with the Indians. Nothing seems to be known of this sculptor or of his work. Another bas-relief in the rotunda is signed by A. Capellano, 1827. The theme represented is Pocahontas saving Captain Smith. This man seems to have done other work, but of no great artistic value.

In 1790, at Rahway, N. J., was born John Frazee, the first American sculptor who was educated and pursued his art at home. His early years were hard. He had been brought up as a stone-cutter, and in 1820 we have a record of the first statues he ever saw; they were some casts sent by Napoleon to the New York Academy of Fine Arts. A portrait bust of his dead child, made before he had seen any sculpture, procured for him an introduction to the president of the Academy, Trumbull, who had put himself on ignominious

record, as having informed him that "nothing in sculpture would be wanted in this country for a hundred years." No wonder Frazee exclaimed: "Is such a man fit for a president of an academy of fine arts?"

Artistic appreciation in the early part of our century seems to have been a rare thing. We find the clear-headed John Adams writing to a French sculptor who wished to make his portrait in 1818: "The age of sculpture and painting has not yet arrived in this country, and I hope it will be long before it does so. I would not give a sixpence for a picture by Raphael or a statue by Phidias." Still, we find him later inviting this sculptor, M. Binon, to become his guest at Quincy, and consenting to the unpleasant operation of having a plaster mask made of his face, as well as posing for a portrait bust. This bust is to be seen in Faneuil Hall, in Boston, to-day. The first portrait bust made by an American is said to be that of John Wells, Esq., executed, after the death of the subject, by John Frazee, of whom we have spoken. Frazee also made busts of Chief-Justice Marshall, Daniel Webster, Judges Story and Westcott, and of Thomas H. Perkins and John Lowell of Boston.

Names multiply rapidly as we study the history of sculpture after 1825. Horatio Greenough and Hiram Powers, two men who have exercised considerable influence on American art, were born in the same year, 1805. Greenough was a man of scholarly attainments and artistic instincts, and those who knew Powers speak high praise of him. Greenough died in 1852, at the early age of forty-seven. He was a man of undoubted power and untiring energy. To him belongs the credit of being the first American who executed a group in marble, viz., that of "The Chanting Cherubs." The design was suggested to him by Fenimore Cooper, who gave him a commission to execute it. Cooper seems to have had a great love for the Madonna di Foligno by Raphael, in Florence, and the idea of

Greenough's cherubs is distinctly traceable to the cherubim in the foreground of this picture. Henry T. Tuckerman, in the "Book of the Artists," describes this group in a beautiful way. Hiram Powers displayed much mechanical ingenuity as a boy. As a youth, we hear of him as having gained considerable reputation for wax figures he executed for a show, and a panoramic spectacle of the infernal regions, in which the little demons he had modeled were made to act their several parts by skilful mechanical devices. Some of Powers's busts deserve all the reputation the last years have brought to him. He had the true artistic insight and pure classical feeling for art. The adulation bestowed upon him when he executed his "Greek Slave" was far greater than the work merited; still, we may excuse it, when we consider it was one of the first statues by an American sculptor that claimed public attention abroad. His busts are characterized by fine spiritual feeling, and his reputation may rest safely upon the ideal work he achieved in this line.

Joel T. Hart, born in Kentucky in 1810, and for many years a resident of Florence, the author of a statue of Henry Clay in Louisville, has achieved a certain distinction in his art. He invented a clever machine, by which the tedious labor of transferring the model to marble has been considerably lessened. He was a careful student of the human form, and a conscientious workman.

Thomas Crawford, born in New York in 1813, was the first American who had a thorough training in his art from his boyhood. He went to study in Italy while still a youth, where Thorwaldsen, that generous Dane, aided him. Charles Sumner made him famous. He found him in Rome, a poor man, unknown and discouraged. He was instrumental in obtaining for Crawford the commission for the group of "Orpheus seeking Eurydice," now in the Boston Athenæum. It is a group composed by one who, though still young, had a fine poetic feeling for what is sculpturesque. The figure of an Indian chief, part of the group in the pediment of the Capitol

at Washington, was so much admired by the English sculptor Gibson, that he wished it to be cast in bronze, and set up as a monument to Crawford in Rome. Crawford died in 1857, at forty-four years of age, in London. His unfinished work was completed by Randolph Rogers, his friend. A complete set of casts from his work may be seen in the Museum of Fine Arts, in New York. These display the workings of a mind original, vigorous, and artistic. He was a man who must have had in him decided power, or he could not have drawn forth such enthusiastic friendship as Charles Sumner showed him. Had he lived to greater years, he would have achieved enduring distinction. We cannot but lament his untimely death.

Other names we may mention now, are those of Henry Kirke Brown, born at Leyden, Mass., in 1814; Henry Dexter, born in Nelson, Madison County, N. Y., in 1806; and Erastus D. Palmer, born in Pompey, N. Y., 1817. These men, in their work, exhibited industry and talent. They were men who worked faithfully, and whose devotion to art we cannot admire too much or too long.

William Wetmore Story, born in Salem, Mass., 1819, son of Chief-Justice Story, unlike the men who preceded him, had from the first all that wealth, culture, and generous surroundings can give to the development of artistic talent. He was a graduate of Harvard University and, after leaving college, wrote law treatises, as well as poetry that has brought him no little reputation. We do not know whether the future will reckon his poetry to be greater than his efforts in sculpture. His sculpture is conventional rather than imaginatively creative. It is doubtful if the rare word genius will ever be coupled with his name. His work shows culture, study, refinement, and elegance; it lacks spontaneity. He has represented the art of sculpture with dignity.

A name which must not be omitted is that of Thomas Ball, born in Charlestown, Mass., 1819, and still living in Florence, Italy. His

greatest work, undoubtedly, is the equestrian statue of Washington in the Public Garden, Boston. After all criticism has been made upon this statue, it stands there for all time as a complete embodiment, nobly conceived and bravely executed, of our first president. The horse is not executed with the technical cleverness that the great French sculptor Frémiet brings to his work; but it may be doubted if the latter could produce a work as essentially monumental as this. Almost everything that Mr. Ball has done shows a feeling for sculpture, true and lovable. It is better to sacrifice the almost fatal cleverness of perfect technical execution than the all-important essential quality which makes a work monumental. Ball's statue is monumental, or nothing.

Much creditable work has been done in sculpture by J. Q. A. Ward, born in Urbana, Ohio, 1830. Two notable figures by him may be seen in New York City to-day, viz., his "Washington" on Wall Street, and his statue of Shakespeare in Central Park. His work displays sufficient technical ability, while the theme chosen is wrought out in a manner that is dignified, straightforward, simple, and sculpturesque. His equestrian statue of General Thomas, in Washington, has been praised by good judges of the art.

Launt Thompson, although an Irishman by birth, has so identified himself with America, that his name must not be omitted from even these brief biographical notes. His talent is refined and finished, with facile power and true feeling for sculpture.

A name which may be mentioned here, and one better known, perhaps, than any other American sculptor's, is that of John Rogers, born in Salem, Mass. (1829), and living now (1894) in New York City. He has done more than any living American to popularize the art of sculpture among us. When his handiwork became known, cheap casts of the vapid figures of Canova and his school became less common. Some of his groups, especially his war subjects, show decided artistic merit; this is conceded by all sculptors and art critics.

Randolph Rogers, who died in Rome about 1890, was born in New York State in 1825. He pursued his art studies chiefly at Rome, where the greater part of his after life was passed. His best known works are the bronze doors of the Capitol at Washington, which represent scenes, in high relief, from the life of Columbus. A well-known figure of his is the "Nydia," a subject taken from Bulwer's *The Last Days of Pompeii.*

The work of St. Gaudens, French, Warner, and other contemporary sculptors, is so well known, that it need not receive further comment here.

Cycles of Development of Art.

GREEK SCULPTURE	ITALIAN SCULPTURE
DAEDALEAN	
AEGINETAN	NICCOLÒ PISANO
TRANSITIONAL	DONATELLO
PHIDIAN	MICHAEL ANGELO
PRAXITELEAN	GIOVANNI DA BOLOGNA
DECLINE	BERNINI
DECAY	DECAY

PART II.

THE PRACTICE OF SCULPTURE.

THE STUDIO.

ERHAPS the first and most necessary thing for the successful practice of the art of sculpture is a suitable studio. This need not be elaborate, nor finely finished, but must possess certain indispensable features. It may be in a loft or outbuilding or unused stable. It should be upon the ground floor if possible, and so arranged that it may be readily warmed in winter if the climate be severe. This is necessary, not only for the comfort of the sculptor, but to keep his clay models from freezing; for clay once frozen crumbles to pieces, and the figure is ruined.

Light. — It is important, also, that the light in a sculptor's studio should be well arranged. The light should come from the north, or as near that point of the compass as possible, because it is desirable to obtain as much daylight as one can without sunshine. The reason for this is, that a bust or statue which stands where sunlight may be thrown or reflected upon it becomes less simple. There are distinct lights or shadows, whereas the same statue in a cool light is seen more sharply and distinctly. The lights and shadows are simple, and the view is not confused by reflected light thrown into the shadow. All light should, if possible, be admitted

from above. When a side-light only is possible, the lower half of the window should be curtained, so that the light may fall down upon the object as it does in nature. In any case, the light should come from one direction only. If the light be admitted from the side, the model must be moved frequently, so that the light shall fall on all sides equally, otherwise the likeness will be perceptible only in one particular light, or from one point of view. It is well to have a studio so arranged that the light may be admitted from different directions if required, so that the model may be seen in various lights, and defects thus detected that might otherwise be overlooked. These various lights should be kept carefully curtained except when required to test the correctness of the work accomplished. When one works by night, the light should be so arranged as to fall upon the front of the work. Many sculptors when working upon equestrian statues or monumental work remove their models into the open air, in order more correctly to judge of the progress of the work. This can most easily be accomplished by the use of tracks. To do this frequently is of great assistance to the sculptor; he is able to judge how the work will appear when set up in its proper position, under the real light of the sky; for the light of the studio, at its best, is defective.

As a rule, the smaller the aperture through which the light is admitted to the studio, the more direct and pronounced are the shadows, and the more clear and distinct is every detail. It will be found convenient, therefore, to have suitable curtains arranged before the studio light, so that it may be easily regulated.

If the light be admitted from above, the skylight should be placed at an angle of not more than 45 degrees — better less.

Construction. — The studio should, if possible, be constructed of wood, and the interior should be left unfinished. Mechanical appliances, which may be necessary in the progress of the work, may

thus be readily attached to the walls if required, and as readily removed. The floor should be well laid, level, and firmly supported. It should be of a material which a thorough wetting will not injure, for in the progress of large work the studio must be frequently washed. The walls should be colored in a neutral tint; terra cottas and grays are most frequently used for this purpose. Care should be taken, in the construction of a studio, to arrange for a door of sufficient size to permit the ready removal of large models and the admission of necessary materials.

Tools. — The sculptor should provide himself with an abundant supply of tools of two classes: first, those peculiar to his work; and, secondly, a good assortment of carpenter's tools. The latter will

No. 1.—TOOLS FOR MODELING IN CLAY OR WAX.

be found useful, and, indeed, indispensable in construction of skeletons, frames, and other appliances, which will be described hereafter. The tools belonging directly to the sculptor's work are well displayed in the accompanying cuts. Experience has shown these designs

No. 2.—TOOLS FOR PLASTER WORKING.

to be best adapted to the work. It is understood, as a matter of course, here that all sculpture is first modeled in clay or wax, and not cut directly, as some suppose, from stone and marble. Hence the tools here shown are those for use in clay or wax modeling. Those employed in stone-cutting will be discussed

No. 3. — TOOLS FOR CLAY-WORK.

under that head. The best tools are made of polished box-wood or rubber, as seen in the cuts. A twisted wire of brass or iron enters into the partial constructions of some varieties. The French school makes use of some tools constructed wholly of steel or iron, with serrated edge.

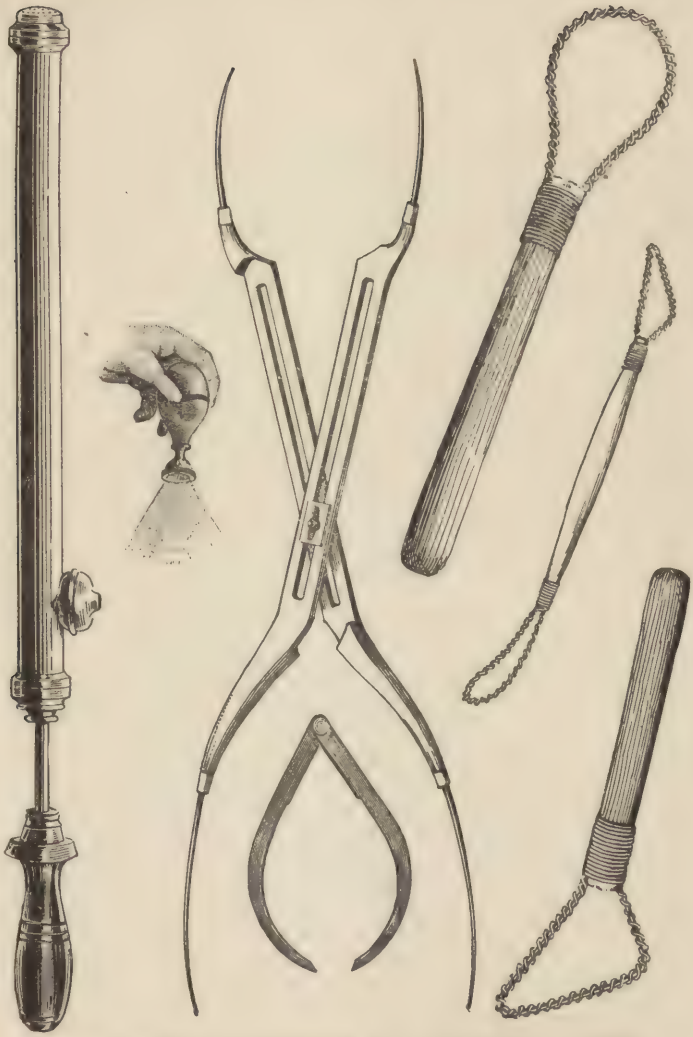
Tools are generally of three kinds, and are to be used only when the work is too fine for the fingers.

1. Tools with chisel edge, either square or oblique.
2. Tools with a convex edge or point.
3. Tools with a concave edge.

Excellent tools are made from cocoa-nut wood. The close surface prevents clay from adhering, and the feeling in the hand is one of pleasure. Tools are usually from 6 to 10 inches in length, and swell toward the middle, which should be oval, so that the tool may be held firmly, and conveniently turned at will between the thumb and the first two fingers. To make these tools, saw the wood into desired shape, then rasp the tool into form with wood-rasp; next, smooth with a scraper or the edge of a piece of broken glass; finish with fine sand-paper, and finally polish by burnishing with a smooth convex steel instrument.

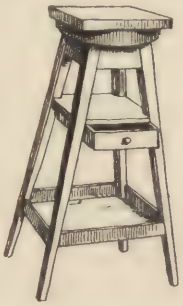
One eminent sculptor has shown that tools are made to use on the parts of a statue or bust only where the fingers cannot be used. A good tool resembles a finger, and is capable of similar and perhaps more delicate work. Each sculptor must find the tools best suited to his own handling. Any well equipped art-store can furnish ordinary tools (see cut No. 1). It is advisable for sculptors to make their own, and many actually do so, since they are simple and easily made. One soon learns from his work the tools best adapted to his hand, and makes them from material near at hand.

Studio Appliances. — The first requisite is one or more good modeling-stands. The construction of these is extremely simple, but must be such as to secure stability rather than elegance. Although some are constructed with three legs, those with four are to be preferred, since the former are too easily overturned. The top should be so arranged as to turn easily upon its rollers or pivot, and thus allow the clay model to be readily turned in any direction.



No. 4. — PUMPS FOR MOISTENING CLAY, COMPASSES, AND WIRE TOOLS FOR MODELING.

The top should overlap the lower part so that the water may not come in contact with rollers or other mechanism and thus by rusting impede their ready action. The construction of the modeling-stand in most common use may be seen in cut No. 5. To prevent warping, the top should be made of two sections, the grain of the lower section set at right angles with that of the upper, and the two sections then firmly fastened together. It is convenient to have a modeling-stand that may be raised and lowered at will; but these are expensive and more complex in design. The ordinary stand can be made by any carpenter or cabinet-maker at a small expense. Hard and thoroughly seasoned wood is desirable. It is a great convenience to have the stand mounted upon rollers, so that it may easily be moved about. In case of large or monumental work, the stand should be placed upon heavy rollers, as in frontispiece, or on a track. In small modeling-stands the top should turn easily upon a pivot let into a socket.



No. 5. — MODELING-STAND.

A number of boxes of varying sizes, strongly constructed, will be found indispensable for the studio. Small holes should be cut in the sides and top, to provide for the insertion of fingers, so that the boxes may be easily moved. A wet sponge is convenient for occasionally cleansing the fingers from accumulated clay. This is necessary since, from the natural heat of the skin, the adhering clay quickly dries and crumbles over the work.

Modeling. — Clay and wax are most easily manipulated. Stone and wood require more time and tools in the working, beside taking greater strength and facility. After one has learned to work in wax or clay, one is better prepared, if the growth has been normal, to carve and cut these less flexible materials.

Modeling should be undertaken before drawing, and is as useful to the painter almost as to the sculptor. We have evidences of crude attempts to carve and model in prehistoric times, before man had learned to draw. In the great industrial schools abroad, and now in our own country, modeling is made the basis of all instruction. By modeling one learns unconsciously to draw. Any one with patience and perseverance may learn to copy simple forms. Experience and skill make the successful modeler. This is the mechanical or technical side of sculpture. One, however, may master its every difficulty and yet not be a great sculptor.

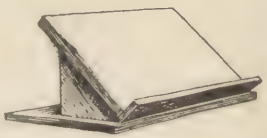
No. 6. — KNEADING THE CLAY.

The mechanical process of modeling is as follows: Having secured the clay from the nearest pottery or art-shop, we proceed to make it ready for use. If it be hard and broken in pieces it must be put in a tub or suitable receptacle and sprinkled with clean water. Leave it to soak and stir it from time to time, so that it may be moistened evenly throughout. Let us start, however, with the hypothesis that you have obtained soft clay, pliable and ready for immediate use. Even in such a case it will be well to work it thoroughly, as one kneads dough in making bread (see cut No. 6), so that every part may respond to your touch. It should be soft as velvet, and all sand and foreign matter should be carefully removed.

Pass your hand through and through it. If it is too dry for easy manipulation, add more water; if too wet and sticky, add more clay, or work with the hands until it is of right consistency. In any case, a good kneading will do it no harm. It is the first lesson in modeling—to knead one's own clay and thus accustom the fingers to its use.

Let your first subject be neither too large nor too small, not difficult nor intricate. Beginners should not attempt anything original. A cast of a strong face with many lines, like that of Dante, or a cast of the eyes or mouth of Michael Angelo's David, would be good for the beginner. Place the subject on a flat board, or, better, attach it to a board constructed for work in relief, and set it at an angle, as shown in cut No. 8. Drive one or two nails into the background, to which attach pieces of copper wire of varying lengths, to the end of which fasten short pieces of wood, made to support the clay. Such supports are called "butterflies." These should be well made. Now, press the clay upon the board and let your wire of "butterflies" rest inside, where they will do the most service as supports. Do not attempt to shape any part in your hand, but put the clay upon the board and squeeze it into the general form of the whole mask or subject to be copied, and so gradually build up until it seems to be of like proportion with the model. Look now to the contour of the whole. Do not become fascinated with, and attempt to finish, any one part; keep all at the same state of advancement, otherwise, in attending to some detail, you will find that the proportion of the whole has been sacrificed. This is a vital law: attend to mass first, then detail will come naturally. One may make occasional use of calipers or

No. 7.—A STUDY.



No. 8.—BOARD FOR RELIEF WORK

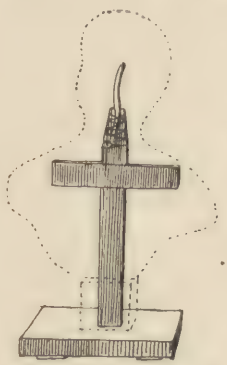
compasses, made as shown in cut No. 4. It is well to keep in mind, however, what Michael Angelo said, viz.: "that a sculptor's compasses should be in his eyes." Train the eye to be its own compasses, lest your work look mechanical. Begin at once to look at your work, as it grows, from a distance. Do not stand over it continuously, walk away every few moments; this is a thing one must make a habit from the beginning. It is the general effect that you are concerned with chiefly; this is vastly more important than fine finish.

The first simple work being finished, a second and more difficult model may be undertaken, such as a mask of St. Jerome by Michael Angelo, or the head of the "Venus of Melos." Be sure to take some worthy subject, so that taste and eye may be cultivated from the first. Some trouble will be found in the beginning in treating hair. Avoid attempting to model every hair. Represent your hair by masses or tufts, not by fine lines, for such give a hard, wooden effect. It is the soft, wavy quality that we care for in sculpture — the *movement* of the hair. The Venus should be taken after the St. Jerome, for the subtle curves of a woman's rounded cheek, or those of a child, are the most difficult things to do in all sculpture. An old head is much more easily copied than a young one. Do not try to improve upon a model. Copy it as literally and neatly as possible.

We may now undertake a bust; let us take, for example, the head of one of the Roman emperors with strongly marked features. The head of the "Young Augustus" can be obtained as easily as any other. Now we must see how best to support the clay. It has not consistency to stand of itself, and we must construct a frame-work or skeleton which will hold the clay firmly and safely. We place a flat piece of board, say six inches square, upon the top of the stand, and into this we mortise an upright, or prop, which is to run up through the centre of the bust and head. It should come within

about an inch of the top of the head. It is a desirable way to make the prop run as high as the neck and then to attach to it firmly with copper wire a strong piece of lead pipe, say ¾ inch in diameter (see cut No. 9). As the lead pipe may be readily bent, this will admit of turning the head in any direction. The action is the first thing to be considered, — the pose or inclination. Do not use string in construction, as it soon rots and smells badly.

A little reading of the general principles of phrenology may now be done with advantage. Learn the salient characteristics of the human head. Camper and Rimmer are excellent authorities. The clay must be firmly pressed about the prop or support and upon the cross-pieces shown in cut No. 9, intended to support the shoulders. This cross-piece must be firmly attached with wire or screws to the prop running up through the bust. In modeling a bust, turn the work frequently and move all about it. Do not develop one side of the head farther than the other. Look at the general contour of the whole. Block or square out the work first. Learn to see the planes in the face and head. Remember that this process of modeling is quite the reverse of chiseling. In carving, one takes a block of stone and chips away what is not needed, until the size and shape correspond with the model or original design. In modeling in clay, we start with a support of wood or iron and build up until the desired height or relief is attained. One should add pellet by pellet, rolling a piece of clay in the fingers into balls, and adjusting with the thumb or tool to the body of the clay. See that each pellet or piece becomes an integral part of the body or nucleus of clay, and firmly welded to it. Eyelids, parts of lips and ears, and other delicate portions are



No. 9. — SKELETON FOR BUST.

formed by rolling clay in the fingers to the desired size, and then applying the roll or string of clay where it is called for and adjusting the same carefully with a tool suited to the purpose.

Learn to look at your work not only from a distance, but step on a ladder and look down upon it; get down upon your knees and look up at it. In other words, look at it from every direction possible. Every change will reveal new defects, if there be any. You cannot look at it from too many directions, be assured of that. At first you will find your compasses valuable aids. Establish certain vital proportions, such as the distance between the eyes, height of face, length of nose, etc. Learn to do without them as your eye becomes trained. Learn from the first to use a plumb-line; a ball of clay fastened to the end of a slight string will answer. Hold this in front of the model; notice the position of the face and its parts with regard to the plumb or vertical in the model; then see if your copy has the same relations when you hold your line in front of it. See if the action corresponds with the action of the model. Leave this work from time to time, being sure to cover it with wet cloths or a rubber cloth, so as to insure its being kept moist and pliable. Sprinkle it night and morning (see Frontispiece). Vary your work with simple designs of foliage, or some decorative, architectural design (see cuts Nos. 10 and 11). The latter teaches precision, because exactness is required. Keep the copy and model on the same level, and as close as convenient to one another.

A hand or foot may now be undertaken. A peg of wood, or large nails set or driven in a board, will form sufficient support for the clay in such simple subjects. Do not try anything original until you can make successful copies of other work. After making such, try a simple head from nature. Find an old man or woman with strongly marked features, who will pose for you. Proceed in modeling from nature as you have done in working from casts.

We come now to the building of a figure of life or colossal size. For sketches, use copper wire for the skeleton; twist one strand upon another, as shown in the design (cut No. 12); attach pieces of copper wire for arms, legs, etc. Any design not over a foot in height may be built upon wire, as skeleton shown in the cut. A design not over six inches in height is often made without a skeleton, having the interior simply of clay, a little harder than that used upon large

No. 10 — SUBJECTS FOR DECORATIVE MODELING

work. In building wire-skeletons, take careful account of the length of the arms and legs, so that the wire may not protrude when the clay is put upon it. Have a canon of proportion, such as that given in Fau and Rimmer.

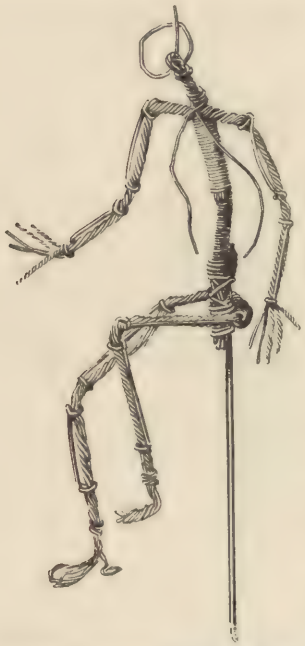
The building up of a large figure has many difficulties. The following method is employed in most studios. If the sculptor is to build a large figure, he makes first a small sketch model, say, from two to four feet in height. He perfects this model, until it expresses

the meaning he wishes to convey — until the action, pose, contour, and expression are satisfactory. It should be built with careful regard to proportion. If the sculptor's figure is to be of colossal size, eight feet in height, for example, a small model may be made, two feet in height, that is one fourth, or four feet, which is half; then, when he comes to construct his large figure, he can, by his enlarging calipers, throw up the colossal statue by a simple mathe-

No. 11. — SUBJECTS FOR DECORATIVE MODELING.

matical process. It is hardly necessary to say that this sketch-model should be studied first from the nude living model, and then clothed in the costume or drapery of the epoch represented. Too much care cannot be bestowed upon this sketch-model; carelessness or hurry at this stage of the work will surely lead to serious trouble and great waste of time, money, etc., later. The art of sculpture requires great conscientiousness; let every step of the work be done thoroughly. A flimsy construction has ruined many a noble statue.

The Skeleton. — Having a modeling-stand well constructed, and, for the sake of convenience, set upon rollers, so as to be readily moved to or from the light, as the sculptor may wish, we proceed to construct the frame-work or skeleton destined to support the clay.



No. 12. — SKELETON FOR FULL FIGURE.

The common method, which is in vogue in many great studios, is to get a bar of iron and to bend it into the general shape required. This iron should have four feet or claws at the bottom, which may be securely screwed into the modeling-stand, or board, or platform nailed upon it, which is to support the statue. This iron, as will be seen, runs up a foot or more in the rear of the proposed statue, then is turned directly forward, at a right angle, so as to enter the back of the statue at the dorsal vertebrae. Then it bends at another right angle and passes up through the torso as far as the nape of the neck. To this iron are fixed cross-pieces of very thick lead pipe or wrought iron. These are to support the weight of the clay at the hips and shoulders, and to these in turn must be attached the lead pipe or irons which are to form the skeleton of the legs and arms. It is readily understood that the iron or pipe in the legs must be left long enough to descend through the middle of the ankle and through the six inches of clay which is generally left under a statue, to the groundwork of boards, and there, where action has been determined upon, they are firmly fixed with nails. "Butterflies" must be attached to the skeleton of

the legs and arms and to the central support of iron. Make use of plenty of these, else you may enter your studio some fine morning and find your wet clay upon the floor. Most sculptors have had this sad experience.

In constructing the support for the head, attach a strong piece of lead pipe to the central core. This will pass through the neck and almost to the top of the head, and will admit of the head being turned in any direction. Make use of small square pieces of wood about the size of a carpenter's lead pencil to strengthen parts of legs and arms where there is no joint. These should be bound about the part to be strengthened; they are found very useful in helping to sustain the clay that is apt to slide away from the limbs. The iron used for the support or core one may call the central iron or backbone. It must vary, of course, in size, according to the size of the statue and the weight of the clay it is to sustain. For an eight foot statue, an iron three inches square, or at least two inches and a half, will be found none too large.

Having prepared, then, our skeleton, we may proceed to the covering of it with clay. The clay should be tightly pressed about the core, which passes through the torso first; then model roughly the limbs, neck, and head. The suggestions given for modeling a bust apply as well to an entire figure, and need hardly be repeated. Make use now of a garden syringe or pump, as shown in cut No. 4, for wetting your figure. If the studio be warmed, this should be done frequently. Throw but a little water upon it at a time, not enough to run; a little stream working its way into the clay will cause a crack and result often in an entire section falling off.

We must speak of the framework of the hands; this should be made of twisted copper wire, in rough imitation of the actual skeleton. The fingers should be so constructed as to be moved in any direction.

We have now given sufficient directions for the construction of the ground-work or skeleton which may serve for any ordinary single figure. Much must, of necessity, be left to the natural ingenuity of the student. Every sculptor has his own methods and ways of constructing supports for his figures. Cut No. 13 shows a sculptor in the act of putting clay upon a large figure. Cut No. 12 again has shown the skeleton of this figure before any clay had been applied to it. The use of certain large tools, as shown in cuts, will be found of great assistance. In all large work use a thin piece of copper wire for cutting clay. Wherever it is necessary to attach drapery to a figure, wire netting of a very coarse mesh will be found useful. Fasten this with long wooden pegs to the body. In this way it is easily and firmly supported.

Now a word as to keeping the clay in working condition. It is not enough to sprinkle it night and morning; it should be covered at night with damp cloths. These cloths should be of very light weight; a thin muslin, such as is used in covering butter, is the most desirable. It will be found convenient and advisable to construct a square framework, which may be suspended over your figure. Attach to this a rubber cloth which shall fall on all sides and over the top, and so excluding the air, keep your clay figure moist and in good condition. This framework may be let up and down by pulley and rope. Most well-equipped studios have one or more of these. If one has no syringe or sprinkler at hand, a small whisk broom may be used to wet the clay.

In throwing up the large figure from the sketch-model, begin at first by taking only the principal measurements, such as height, breadth of shoulders, position of chin, nipples, navel, thigh bone, patella, etc. Your large figure at this stage should be studied from the nude model, and the muscular forms roughly blocked out, no matter if they are to be entirely covered with the costume. Select for this purpose a model with an exaggerated muscular development,

No 13 — SCULPTOR AT WORK UPON CLAY MODEL.

or your statue, when completed and covered with its drapery, will look thin and lifeless. As you establish different points of measurement, or proportion, from the little model (of which it is advisable to have a nude study), by means of your enlarging compasses, put in small wooden pegs, — they come of a wedge-like shape, about an inch and a quarter long, the top end of the thickness of a lead pencil, and tapering to a point. From the moment you begin to put your clay upon the skeleton, make constant use of the plumb-line.

Proportions of the Figure. — Proportion is the true relation of one part to another, and should produce on the mind the effect of a harmonious whole. It may be defined simply as harmonious relation or symmetry.

Even the nymphs, satyrs, centaurs, and other creations of the Greek fancy were produced according to strict laws of proportion. With the decadence of Greek art artistic proportions were lost sight of. In the tenth century the crude sculptors of the new religious art produced figures varying from four or five heads to fourteen heads in length ; there seems to have been no established canon. In the middle ages little thought was given to harmonious proportion. The sculptor thought only of the fervid, religious idea or symbol he wished to embody. The ugly seems to have been thought an effective way of representing a religious idea.

Toward the end of the fourteenth century, at the time when the Belvedere torso was discovered, and many other antique sculptures unearthed, may be noted a return to the old laws and principles governing proportion and construction; and finally Michael Angelo accepted and restored the Greek standard of Vitruvius. Each statue should be distinct, individual, and harmonious in itself.

If you put a long head on a square body, or a square head on a long body, the appearance is incongruous and disproportionate ; no sense of harmony is produced. But if you place a long head

on a long body, or a square head on a square body, the result is harmonious.

The difference in the height of people is the difference in the length of the leg. A number of people seated together will appear of about the same height.

In this book we shall hold to the system of proportion formulated by Vitruvius, which he deduced from the writings of the most eminent Greek sculptors, and which Michael Angelo adopted. He gives us this general rule, viz.: that the ancients made their figures eight heads or ten faces high; and that all other subdivisions of the body were based upon this standard. He takes the head as the unit. The common divisions in length of the human figure are as follows:

Total height of figure, eight heads (that is, skull-lengths). The average male head is 8¾ inches; this would make a figure of 5 feet 10 inches. For artistic purposes it is well to make the figure 6 feet high. From the os pubis (or pubic bone) to the sole of the foot, one half; from the os pubis to the top of the head, one half. The os pubis should always be the centre of the total length of the entire figure. Flaxman gives the three following divisions, viz.: first, from acromion process (the upper process of the shoulder-blade articulating with the collar-bone) to the front termination of the pelvis; second, from there to the top of the patella or knee-cap; third, from the top of the patella to the bottom of the inner ankle.

To lend added grace, the Greeks added an inch or two of length to the lower limbs in excess of the length of the torso. The legs may be made more graceful by increasing the length from the patella to the sole of the foot. The dignity and grace of a figure depend largely upon the length of the lower limbs.

The average foot-length, 11 inches. Two foot-lengths are allowed for the length of the leg from the ground to top of the patella.

The Arm. — From acromion process to elbow (in straight arm), 1½ heads. From elbow to first knuckles, 1½ heads. As a general rule, from acromion process to elbow is the same distance as from the elbow to the first knuckle. The hand is the same length as face, or ¾ of a head.

Breadths. — Shoulders between the two acromion processes, 2 heads. Across the loins or edge of pelvis, 1¼ heads. Across hips or trochanter (one of the two processes at the upper end of thigh-bone), 1½ heads.

Depths. — Shoulders from pectoral to shoulder-blade, 1⅛ heads. Loins, rim of pelvis, ¾ head from front to back termination. Gluteus, 1 head.

Proportions of the Female. — The proportions of woman are in the lengths the same as those of man, viz.: the whole figure is 8 heads in length. The average female head measures eight and one fourth (8¼) inches from the bottom of the chin to the apex of the skull. This gives us, then, a figure 5 feet 6 inches in height. If the lower limbs are equal to the length of the torso, this would be the average size of a woman. The Venus de Medici is 5 feet and 3 inches in height. The head measures 7½ inches in length. The centre of the whole figure is the os pubis, or front termination of the lower part of the pelvis. The width of shoulders, 2 heads; width of hips or trochanters, 1¾ heads.

Length of Arm in Female. — From acromion process to elbow, 1½ heads. From elbow to first knuckles, 1½ heads. Length of foot, 1⅛ heads. Length of leg, 2¼ heads.

A proportion common to both sexes is this, viz.: the outstretched arms, measured from tip to tip of fingers, will give the same length

as the total height of the figure. From the pit of the throat to the nipple of the breast, 8¼ inches, or one head-length, and the same from nipple to nipple. The difference in the proportions of the male and female skeleton is in the widths. The bones in the female are of greater delicacy and lightness. The collar-bones sloping, seem to lengthen the neck. As these proportions fell into disuse after the time of Phidias, Praxiteles, and their immediate followers, art began to retrograde.

Expression. — Expression has been called the soul of art. It may be best described, perhaps, as that characteristic or attribute which distinguishes one individual from another. For example, a friend is coming toward you from a distant point; he is too far away for you to see his face or the details of his clothing, yet you recognize him at once by a peculiar gait, inclination, or attitude. It is this distinguishing trait with which the artist is vitally concerned. Great artists receive and give forth this characteristic of "expression" in a large and dramatic way, while inferior artists seldom rise above the theatrical rendering of it. The study of the sketches of Michael Angelo will lead to an appreciation of this great quality better than many books written upon the subject. (Bear in mind, however, that his chief defect sprang from too fervid expression.) With a few sweeping lines he gives the entire character of his model. Expression is obtained by looking at a thing in its great curves.

One man, for instance, drops his shoulders and head in a peculiar way; you know him at once from any of his townsmen; another has a long, ambling gait. As men depart from the normal, the more are they easily represented in art; that is, the lowest and easiest form of art is caricature. Expression, while a vital quality, is not sufficient of itself; and where it has become all-important, the decadence of art has quickly followed. See, for example, the debased school of Bernini and his followers.

Expression may be said to belong as much to the mental and sensuous make-up of the artist as to the purely technical side of his art. Genuine feeling will do more to make art impressive than any possible or strained expression. This is shown in the work of the early masters. The pure and simple forms used by Donatello and the Della Robbias are certainly more impressive and characteristic of a greater art than the work of Bernini and his school, which has already been referred to. If one lacks this quality, it is most easily obtained, perhaps, by attendance at any well-ordered theatre, especially such a theatre as the French have, where comedy and character-depiction is the chief aim.

Harmony. — For a fine sense of harmony no nation has ever equalled the Greek. Let us take, for example, the statues of Antinous or the Adonis of the Naples Museum, typical embodiments of perfected youthful grace and rhythm. The large forms in these statues are given with a calm firmness that would make them charming and restful if only fragments were left to us. Let us look, on the other hand, at the fighting gladiator of the Louvre. Study the balance and proportion of the whole. Every muscle is brought into proportionate use; one side is not developed at the expense of the other. It is consistent and harmonious throughout, though not of the best period.

Two distinct types are given in two female figures of antiquity, viz., the Venus of Melos and the Venus de Medici. Both measure eight heads in length; the one is calm, majestic dignity; the other, soft, winning grace. Utterly different, yet each is harmonious in itself.

Composition. — Composition is largely a mental operation; for, until the hand has been trained to execute, thought is of little avail. It comes naturally after invention. It may be considered under two

heads: first, as it pleases the eye, by happy and proper disposition of light and shade; and, secondly, as it gives more adequate expression to the theme, by preserving a correspondence between the sentiment of the subject and the material employed. In all cases the object and ultimate aim of composition is to develop the sentiment or poetic feeling which it is desired to express. It is the echo of the sense, as much as sound is in the writing of poetry. It is an all-important consideration. The Greek had mastered its laws completely. Given an architectural space to decorate, he filled it so adequately as to leave nothing further to be desired. Neither can anything be taken away without taking away from the meaning it is intended to convey. The greatest composer of modern times, perhaps, is Michael Angelo. No more felicitous arrangement can be suggested, perhaps, than that of the ceiling of the Sistine Chapel.

Drapery. — After considering the nude figure, its sentiment, character, and expression, after having determined upon our action, and developed the different muscular forms and superficial anatomy, we come, naturally, to consider the drapery or costume with which we are to clothe it.

The lines of the drapery should be contrasted with or opposed to those of the figure, and in other cases should be parallel to the latter. All this fine and sagacious choosing belongs partly to the artist's instinct for selection, and as much, perhaps, to the education he has received and the antique models he has studied. Let us look at the principles, or laws, which govern the curves and folds which drapery takes on. We must consider, too, the difference between heavy and light drapery.

Drapery, then, like other things about us, is subject to the laws of gravitation and motion; and is affected more or less by these laws according to its weight or airiness, its strength or weakness of texture, the force of wind or other power moving it, — according,

of course, to the action or lack of action in the wearer. This study of drapery is very intricate; it will either add to or take from the force of character of your statue; and it must add to or take from its poetic meaning. It is not an accessory, but a vital part of your figure. The Greeks achieved preëminent distinction in the treatment of drapery. No artists before or after can be compared to them, except, perhaps, the masters of the Italian Renaissance. The Greek used drapery to make his figures terrible, mystical, or sublimely beautiful. Study a cast of the statue of the "Nike of Samothrace," or "Winged Victory"; see what added motion is given to the figure by the way in which the drapery is thrown back.

The most common and simple forms of drapery are those produced by the weight of the cloth hanging straight down from two projecting points of a surface or figure. These forms we call folds, and a succession or series of such folds lends dignity, height, and massive strength to the figure. See, for example, what nobility such straight folds have given to the archaic Greek statues. Such folds can be used with good effect when opposed to the soft curves of the arms or shoulders.

One of the first facts we must consider in drapery is its uniformity. It may be thick throughout, or light and easily agitated; but it should be uniform throughout, for all artistic purposes. If it is not so, we can make no laws for its action, and shall have to trust the clothing of our figures to haphazard. Let us assume, then, that whatever quality or weight our drapery possesses, we may depend on its being uniform. Naturally, the heavier the material, the broader and more generous are its folds; while, if the drapery be thin and flexible, the number of folds is greatly multiplied; and this idea is more marked where the drapery is suspended from the figure; for the light weight of the stuff enables the model to take up easily a great quantity, and to throw it over the shoulder, or to gather it in

drooping folds over the girdle, or to fasten it easily with a pin or brooch. Textures that feel soft in the hand assume naturally soft and pleasing curves, while harsh or heavy material is apt to take on folds that are sharp, cross cut, and angular in character.

If we throw a piece of drapery carelessly over any object, it rests, naturally, on the most salient points of such object, and it will fall either perpendicularly as the folds we have previously described, or it will be caught up and hung in waves or festoons. If the drapery is very heavy, it will hang in folds that radiate from the point of attachment. All folds radiate from the points of support, or from the points or places where they are gathered and held up, according to the fashion or necessity of the time. These facts regarding thickness or lightness, harshness or softness, abundance or meagreness of drapery, together with this law of radiation from points of support, are the facts or basis upon which we construct draperies.

Where two points of support are equally distant from the ground, and of equal prominence, it is easy to see that drapery will fall in symmetrical waves between them ; but where one is more prominent, the folds will meet alternately and give greater sharpness and variety to the composition. Where much drapery hangs from one point, it will drop straight down ; but the central line of the whole mass, it will be seen, is the only one which is actually perpendicular.

So much for drapery hanging from points or supports. Where drapery falls loosely over the figure, a general direction or inclination is given to its folds by a drawing of it, or pulling toward some other part of the body by action or change of motion. In cases like this the laws that govern it are as manifold as the actions which the human body may assume, or the causes which may affect it. Such cases must be studied always from nature. Mr. Moody, formerly of South Kensington, gives a general rule that "folds will be shaken out from the front and upper parts of the body or limbs, and will be naturally found where there is more room for them ; for we should

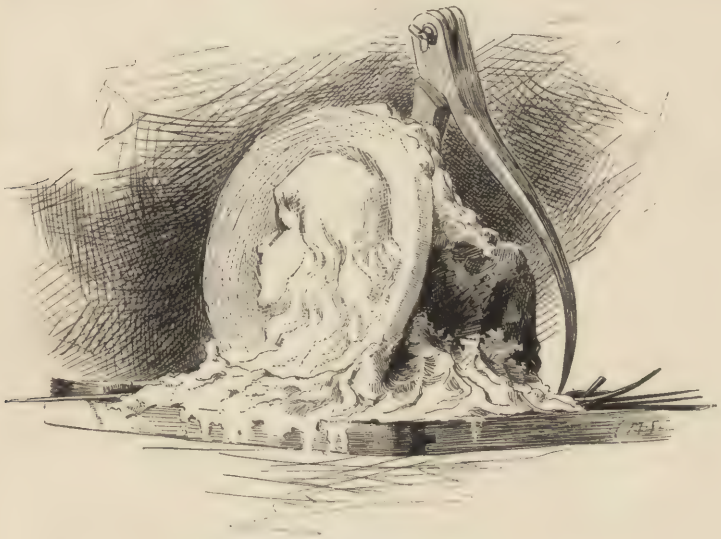
never forget that depth is necessary to folds. Where this ceases to be the case, the drapery must either be plain or in flat plaits." The same critic shows, in his excellent lectures, how color, variety, motion, and mass are given to the figure by a proper use of drapery; and how necessary it is to art and to plastic and pictorial interpretations of history and the social distinctions imposed by society. The king is known from the beggar by the character of his drapery. Perhaps he exaggerates its importance; for it is certain that the nude figure in the hand of the Greek and modern artist has been made inexpressibly lovely; still it is so valuable an adjunct, and so much a part of man, that we must understand how to handle it, and have full appreciation of the dignity of its office.

Modeling in Relief. — In the modeling of reliefs one usually places a layer of clay upon a slab of slate or square drawing-board, varying in size according to the requirements of the work. Clay must be put on of depth sufficient for the intended relief, — little for low relief, like the work of Donatello, a great deal for such work as the Della Robbias did. Many modern sculptors draw an outline upon their slab of slate, then fill it in with clay to the thickness desired, thus keeping the work true to one plane. This is the common, and, one may add, commonplace, manner of modeling bas relief. Men who have studied this subject in an exhaustive way believe that the true and artistic way of modeling in relief is as follows:

The background should be of clay, and no part of the relief should be made higher than the background. One advantage, ostensibly, of this order of relief is that the spectator can see the work only from the right position, viz., the front. We are speaking more particularly in this respect of low and middle relief, and not of high relief. Most relief is meant to be lighted from one side, but seen from the front. Work in relief may be called a compromise between drawing and modeling. To be successful in this order of sculpture

requires true artistic feeling, and great knowledge of the laws and limitations of sculpture.

Egyptian and Assyrian reliefs are particularly interesting, and are usually found to have been cut out of, and not attached to, the background. A comparison of modern work with that of Greece, or even of Egypt and Assyria, will show that the sculptors among



No. 14. PORTRAIT RELIEF IN MARBLE, READY FOR FINISHER.

even these ancient people understood work in relief, or the technique of relief, better than most modern artists. The variety given by the uneven and waving background of antique work accounts largely for its charm and its vital force. In what work we have of Greece, scarcely an instance can be cited where the background is the level plane so much used to-day. The background should vary according

to the feeling the sculptor wishes to express. There are occasions when we must cut below the average surface, and sometimes, to obtain an effect, the background must rise to give the desired shadow over form or feature.

It is easier, of course, to make high or alto relief than to execute low relief. It is readily seen that striking effects are at once obtained in high relief. Less subtlety of genius is required for this kind of work. The method practiced by certain medieval sculptors — of modeling in low relief, then raising the whole design, and cutting a groove about the outline — should not be copied. It partakes too much of artifice to be called legitimate. Serious men will avoid it. The student should take great care to see that the light falls upon his work from only one direction. It may be either a top or a side light. Modeling in relief is a branch of sculpture that cannot be taught. It comes largely from poetic feeling and instinct for the subtle and illusive forms or ideas. The study of Greek models, however, will be of great benefit.

Modeling of Decorative Work. — In the modeling of small objects, such as fruits, flowers, or parts of foliage, the clay to be used may be placed upon a slab of slate, so that the work when completed may be easily removed from the background. It is found convenient often to place under the subject a block or rectangle of clay of an inch or more in thickness, which may be taken hold of and turned in the hand. This permits reaching readily every part of the work. Delicate portions, such as stems of flowers and fruit, are made by rolling bits of clay between the fingers. The petals of flowers are often modeled independently, and adjusted to their places with a small wooden tool. If the subject is not to be taken from the background, artistic and delicate effects may be obtained by cutting below the surface of it, or drawing the subtle portions of the design upon it with a delicate tool.

If the work is designed for terra-cotta, care should be taken that no air-holes are anywhere left. Wed each part firmly to the body of the work, or to the ground to be decorated.

Modeling of Plaques, Vases, etc. — This order of modeling is not difficult, but requires considerable practice to produce successful results. In decorating a vase, choose one that is slightly dry, and a day or two after it has come from the potter's wheel. It is often convenient to do such work at the pottery, or to have in one's studio a potter's wheel. By choosing clay slightly dry, sufficient firmness is given to resist the pressure of the tool or hand when decorating the same. It will be found interesting to use clays of different color. Pleasing results in color are thus obtained.

Architectural Designing. — Architectural decoration opens out a vast field for the modeler. The process is the same as that described under the head of "Modeling of Decorative Work." Such designs are always baked, and become terra-cotta. This material is as durable as, and will resist fire better than, any stone. A special clay is used for this purpose, made up of a combination of potter's clay, fire clay, alkalies, and ground potsherds. The mixing of the whole produces a harmonious substance, which, under the action of fire, vitrifies, and does not require glazing afterward. When baked, this composition is proof against the ravages of time as well as of fire.

The decoration of brick buildings, which is now coming in vogue, as well as the interior ornamentation of fire-places, gives a wide field for development of this order of modeling.

Terra-Cotta Work.— Reference has been made to the preparation of work intended to be baked or fired. If the model be a statue, bust, or other work, care must be taken that space is left in the

body, limbs, or head for air to circulate freely, so that the work may dry equally in all parts. When the clay has become slightly dry, parts may be removed with a fine copper wire and the necessary hollowing made. Then the parts may be replaced. The work should not be taken to the pottery until the clay has dried as thoroughly as is possible without the direct action of fire. The ancients used terra-cotta, or baked clay, not only for statuettes and figurines, such as those of Tanagra, but, moreover, for life-size and colossal statues. There are statues of Jupiter and Juno of full life-size in the museum at Naples in this material. To-day, terra-cotta is used mainly for decorative purposes, and to preserve a sculptor's first small sketch of a proposed work.

Mould-Making and Casting. — After having finished a work in clay, no matter what it be, the artist must put it in some more durable form or material. The material which is most used is called plaster of Paris or calcined gypsum. This process of "casting" may, with patience, be learned by any one ; it is entirely mechanical. To do it nicely requires no little experience, however. You ought to begin with some small and simple subject — take, for instance, the mask of Dante, to which we have previously referred. Place your clay copy of it upon a horizontal stand, and build about it a border or wall of clay of, say, a half inch in thickness and an inch in height; this is to keep the liquid plaster from running away. If the model from which you are to cast be of plaster instead of clay, or of any hard material, the process is much more complicated; we shall describe such processes further on. For the present, we shall assume your model to be of clay. Plaster will not adhere to soft clay ; so if our mask of Dante be of clay and in good condition, you may mix your plaster and proceed at once to make the mould, which is the first step. Take a common tin basin or bowl, holding, let us say, two quarts and a half, and pour into it two quarts of water. Now,

having procured your plaster of Paris (it is usually sold at paint-shops), sprinkle it into the water, shaking it all about lightly until the plaster seems to have almost filled the dish and absorbed the water. Stir the whole mixture now with a large spoon until the consistency be perfectly smooth and like thick milk or cream. See that the plaster does not form into lumps or balls; stir underneath the surface, so that air be not introduced; now pour or put with the spoon some of the new-made mixture upon your clay model, and be sure that the liquid fills all the recesses of the model. It is well sometimes to blow the liquid plaster into the eyes, ears, and other intricate places which otherwise it might not reach. Now pour your plaster on quite fearlessly until it shall have covered your model to the thickness, let us say, of an inch of the plaster (an experienced caster would make his mould thinner). In about fifteen minutes your plaster will have "set" sufficiently for you to take away the border of clay, and in half an hour more you may turn over the solid mass and dig out the clay model. This should be done carefully, so as not to injure the underlying mould. Remove the clay from the intricate recesses with a small wooden modeling-tool; clean your mould thoroughly with a soft paint brush, and set it aside to dry for some hours. This process of drying may be hastened by placing the mould near the fire.

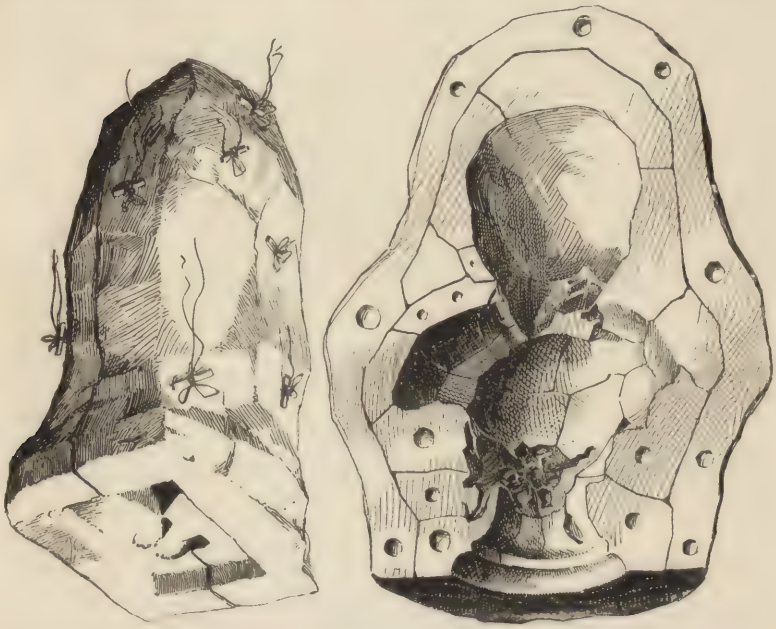
When the mould is found to be thoroughly dry, give the inside two coats or more of linseed oil or shellac varnish, put on carefully with a clean brush; fasten the mould, face down, by setting blocks of wood or broken brick about it to support it; then, having mixed your plaster as above described, pour it into the mould, and see that it penetrates into every crevice and fills the entire space. Let the plaster set for an hour; then turn the mass over and begin to chip away and destroy the mould; use for this purpose a dull chisel of about half an inch in width, and a light wooden mallet. Be careful that you do not injure the underlying cast. When this breaking

away has been accomplished, your cast is complete, and it should be a fac-simile of your clay model. While your plaster is yet soft in the mould, it is well to insert at the top of the face a twisted loop of copper wire, bent at the ends, by which the cast, when complete, may be suspended.

In casting a bust or statue from the clay, one half is first covered with the liquid plaster, which is allowed to "set" before the other half is covered. The two halves are kept from uniting by a solution of clay water or oil painted upon the edges. By this means the mould may be divided and the clay model more readily removed. In casting large statues, a projecting leg or arm is often removed and cast separately.

The kind of mould we have described is called a waste mould to differentiate it from what is known as a piece mould. We may now give our attention to casting in piece moulds. A reference to cut No. 15 will show you such moulds. In the same cut you will see the half of such a mould. No student should attempt to make a piece mould of any work of value until he has watched the operation successfully executed by the hands of experienced mould-makers. Piece moulds are almost never made from clay originals. The original should be in plaster, marble, or bronze. If you wish to undertake the work, you must begin by thoroughly soaping the original, so that plaster will not adhere to it. Now mix in a quart bowl as much plaster as is thought necessary for the piece to be taken, and apply it to the original wherever it is found best to begin the work. A little experience soon teaches that plaster parts may be taken off only from smooth or rounded surfaces, and where no undercuts (or underlying crevices) exist. In the casting of an eye it may be necessary to make several different pieces; when one piece has hardened, trim its edges smoothly and pass around them a coat of shellac, clay water, or any liquid which will prevent the fresh plaster from adhering to said part. More plaster must now be mixed, and the

adjacent surface covered, allowing plaster to form close up to the finished piece; then a third piece must be made, and so on until the whole model or original is covered. Over these little pieces pass a coating of shellac; pour on a large covering of soft plaster, and allow this to set. You will understand this covering best from a



No. 15. — "PIECE MOULD," SHOWING INTERIOR.

reference to cut No. 15, which shows it about the small pieces, holding them firmly in place. This casing or cover the Italians aptly call the mother-mould, which keeps the small pieces, or little children, together. Holes are bored in the top surface of this, as shown in cut No. 15, which are known as keys, and which allow the other half

of the piece mould when completed to be safely and readily attached to it, thus forming the whole piece mould. In the cut you will see depicted, on the exterior surface of the piece mould, wooden pegs held in place firmly by pieces of string. These are made to hold in place such underlying pieces as would fall out when the mould is moved about. It is believed that the cuts will explain this process of making piece moulds better than any words can possibly do. Such moulds, when completed, are shellacked and partially filled with liquid plaster, having been securely fastened together with rope, and when this has set, are taken apart. This mould may serve for many castings, while a waste mould serves but for one example. Cut No. 16 represents a workman engaged in putting together the various parts of a piece mould.

We may now consider a third process of casting, invented within the last twenty years, and known as gelatine casting. Let us take, once more, a plaster cast of the bust known as "The Young Augustus." We cover this head with tissue paper to prevent soiling, and over this we lay a coating or casing of soft clay, say half an inch in thickness. The gelatine ultimately is to fill the place occupied by this clay. Let us now make a simple mould of two pieces over this clay coating; while the plaster is still soft, divide the mould by a piece of strong carpet thread passed around the entire bust over the shoulder and across the topmost ridge of the ears. When this is set we remove the two halves, take out our clay casing, remove the paper from the model, and, having given the latter a coat of shellac, if it be of plaster, place it again within this new-made mould. It will be held in place by keys, or points of plaster, which have been left for this especial purpose. We see now that there is a hollow space about the bust between it and the outer mould. We now prepare our glue or gelatine. Peter Cooper's white glue may be used as well as fine gelatine. This must be boiled and liquefied in what is termed a milk-boiler. When it is soft we may pour it into

the space left for it about the model. Let it harden over night; then carefully separate the halves of the mould. This will leave a casing of gelatine about the model, which can be removed only by cutting it in halves. Now remove the model, and replace the halves of the gelatine mould within the corresponding halves of the plaster shell. Now reunite the whole, and the mould is finished and ready for use.

No. 16. — PUTTING TOGETHER A PIECE MOULD.

Small objects are cast of solid plaster, but busts and larger objects are cast hollow. This last is done to insure lightness, strength, and economy. The hollow casting is effected by pouring a small quantity only of the liquid plaster into the mould at one time, and by maintaining a constant rolling of the mould, so that the plaster shall cover all portions of the interior equally. One entire coating of the interior of the mould must be completed before the plaster begins

to "set." The other coatings may be added at will. Rods of iron are often inserted in the legs or arms of statues to insure strength. In the casting of reliefs a layer of burlap or of flax is often inserted to insure lightness, as well as to hold the material firmly together.

Press Moulds. — There is still another kind of mould sometimes used, which we may call, for want of a better name, a press mould. Such moulds are used where it is intended to reproduce a work of art, or where many copies of the same model are desired. If one, for instance, has made a relief, with no undercuts, in casting the same it will be seen that the mould of plaster of Paris, made over it, can be removed without any injury to the model. This mould, then, may be used to multiply any number of copies like the original, and this is done by simply pressing the clay into the mould, beginning from the centre, let us say, and working out toward the edges, putting every fresh pat of clay upon the starting-point in the centre, and thus making the under-clay cover the entire surface of the mould and leave no cracks or joinings, which would occur if clay were put on at different points and worked together.

The little statuettes, so common in Europe, made of terra-cotta, are reproduced in this way. The clay having been pressed into piece moulds, it will be found useful and interesting to take, let us say, some mould of a little head in low relief, and having made a press of it in clay, to change the entire expression by jarring the clay impression from the bottom or side. With one head as a basis, almost every conceivable expression and shape may be obtained ; then, too, a press mould is useful, because it often saves labor. Having a good normal head as a basis, we may readily change the relation of one part to another, and so make the portrait of any subject in a short space of time.

Tinting of Plaster. — It may be well to make brief mention of the methods commonly used for tinting casts in plaster of Paris,

and obtaining some surface that will admit of their being readily cleansed; for, unless such surface is added, it is difficult to freshen a plaster cast when once soiled. The surface known to sculptors and plaster-cast manufacturers as the "ivory finish" is produced as follows: The subject to be coated is placed near a fire and warmed; then ordinary stearin (from which cheap candles are made) is melted, and if the subject is small enough, it is either immersed in a bath of this liquid stearin, being done very quickly, or else the model is held over the bath (having been warmed), and the stearin poured over it quickly from a bowl. The coating thus obtained is hard and shiny.

Good effects are often produced by mixing a little yellow ochre or burnt umber with oil, or turpentine, or even water (we speak of dry colors), and rubbing it over the entire surface; then the high lights are cleaned up with a soft piece of flannel, and the color left in the places where it is desired for artistic effect.

Another way in vogue among sculptors, more than with the plaster-cast manufacturers, is to dissolve common beeswax in turpentine, making a thick mass, and then to re-dissolve a part of this compound (according as the coating of the cast is too light or heavy) in other turpentine, and apply with a soft brush to the cast. Color may be added to this finish if desired.

Yet another way is to paint the surface of the cast with a solution of white lead and linseed oil, very thinly mixed. Any of these surfaces may be cleansed with a little tepid water. Many casters obtain a simple surface by coating the subject with linseed oil or soap.

The tinting of marble we shall consider under the head of Polychromy. It may be suggested here that nothing is so fine as the pure white plaster, provided a suitable light may be found for the cast. Color is useful to counteract the effect of cross-lights. When small pieces, such as statuettes and reliefs, are to be produced and tinted, it is best to use the fine grade of plaster known as alabaster plaster.

The best tinting of casts and coloring in imitation of antique and renaissance work in this country is undoubtedly that done by Mr. Charles Hazeltine of Providence, R. I.

The most complete plaster cast shop in the world is that of P. P. Caproni & Bro., Province Court, Boston. It is well worth a visit, for here one can see every variety of work in progress.

Casting in Bronze. — Bronze casting dates from that period known to archaeologists as the Bronze Age, a prehistoric time lying between the age of stone and that of iron. The brass spoken of in the Bible is probably another term for bronze. The working of iron and steel seems to have been little known or used by the ancients; their armor, weapons, and utensils were usually made of bronze.

Bronze is an alloy of copper, with eight or ten per cent of tin, to which ingredients a little lead and zinc are often added to render the melted mass more fluid and fusible, so that it may fill and flow into all the intricacies of the mould. (See cut No. 17, representing the fusing process in bronze casting.)

Copper is more easily fused by the addition of tin as an alloy. If it is desired to produce a bronze of a very hard and durable nature, the compound is made up of about seven parts copper to one part tin. If, on the other hand, a soft bronze is sought for, to be rolled or worked, the compound is made up of sixteen parts copper to one part of tin. Eighty parts of copper to twenty parts of tin is a common compound for statues and reliefs. From the introduction of metals into the compound, a variety of bronze has been obtained, varying in hardness and color. The method of fusion also affects results. Gold, silver, copper, and lead, and a fusion of lead and tin (producing pewter), besides tin, have been used as alloys in modern as well as ancient times. The alloy chiefly used by the ancients was made up of copper and tin. Those that have been tested are said to contain from ten to thirteen per cent of tin; the

proportion of tin used to-day is less. In the making of bronze, various nations have used different proportions. The bronze of the Greeks had lead, silver, and gold often added to the composition, and the Romans, in their day, adopted the Greek system of pro-

No. 17. — BRONZE CASTING — FUSING THE METAL AND PREPARING THE MOULD.

portion. To-day bronze is composed most frequently of two thirds copper and one third brass, to which ingredients are added, sometimes, small quantities of lead and zinc. The latter metals tend to make the cast more firm and brilliant.

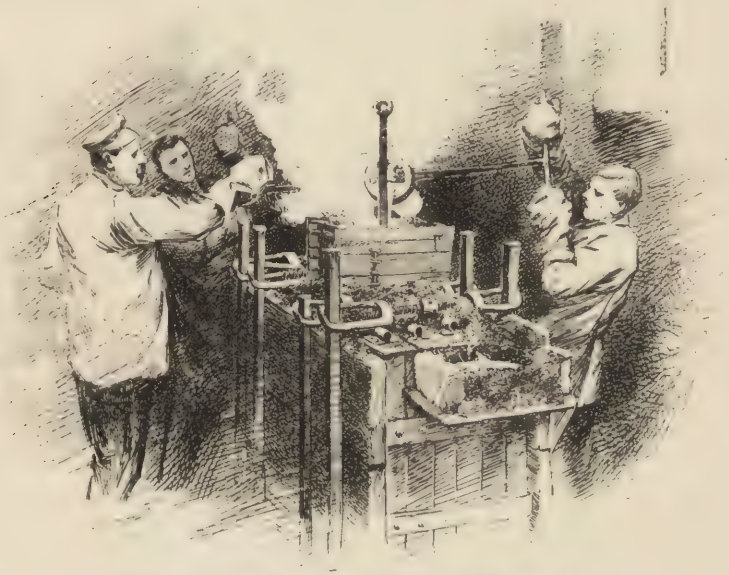
With the ancients bronze casting was carried to a high state of perfection. The Egyptians, Greeks, and Romans made use of it not only for statues, but in the architectural decorations of their temples, palaces, and gorgeous theatres. The wealth of certain ancient cities was gauged by the number of bronze statues they possessed. The bronze of Corinth, Delos, and Egina is famous in history, while Athens, Rhodes, and Delphi are reported to have owned upwards of three thousand statues each.

Casting in bronze is a difficult process, and requires great experience as well as sagacious judgment; for good work a thoroughly equipped workshop is necessary. It is the delicacy and refinement of the workmanship, rather than the color, that distinguishes fine bronzes. All bronze comes from the fire with a brassy tone or color. The patina or color desired is given afterwards by suitable oxidation or sulphurization. Black, red, brown, or green can be easily attained. The color itself has nothing to do with the cost of bronze. It is the labor expended upon its production.

Bronze is cast in two ways, viz., the common way of sand-casting, or the process known as the "Cire Perdue," or "Lost Wax" method, which found favor with the masters of the Italian Renaissance, and has lately come into vogue once more. The method of casting in sand may be described as follows:

A model of the subject to be cast is taken in plaster of Paris. Over this model is made a mould of fine sand, called caen-sand, according to processes described under "Piece Moulds." This sand, while wet, is beaten into the desired firmness with small hammers, and under this hammering process it becomes as hard as stone. When the mould, then, is thus firmly made or formed, the model or core is removed, and the mould filled with the liquefied metal. It is to be understood that the mould, before it has been finally fastened together, has been perforated by a number of channels, to admit of the liquid metal being poured readily into it, and being

allowed to escape easily when the mould has become full. Cut No. 17 shows the men at work preparing the liquid metal, while cut No. 18 shows the metal in a perfectly liquid state being poured from an earthenware vase into the mould which is prepared to receive it. When the metal has cooled, the external casing or mould is taken off, and the metal retains the rough surface of the sand in



No. 18. — BRONZE CASTING — FILLING THE MOULD.

which it has chilled. It can be seen that the reproduction secured by this method of casting must be an exact fac-simile of the model. Over the rough surface, when bronze comes from the mould, is passed a graving-tool, or chisel, to give a desired polish or remove marks or "jets" left by the mould.

Sometimes the whole design is engraved or chiseled without any previous casting. When this is the case, the metal has been given its form by a process of hammering or beating, and is called beaten or wrought work. When iron or bronze is to be beaten the metal must be hot; but in the case of gold, silver, and softer metals, it is hammered or worked cold upon an anvil.

The "Cire Perdue" is a process dear to every true sculptor; because by it bronze is made to reproduce the exact model and touch of the sculptor's hand, without the least after-chiseling or polishing. It is used chiefly to-day for the reproduction of statuettes and busts. It has its dangers and drawbacks. Notwithstanding these, some of the more daring artists of to-day are using this method for the reproduction of important monuments. One of its chief advantages is, that when the model has been transferred to wax, from which the cast is made, the sculptor may enter the foundry and retouch his work at the last moment. The "Lost Wax" method may be described as follows:

When the thickness of the bronze statue or work has been decided upon, wax is run into the space between the core and the mould which the bronze is finally to occupy. The core and mould are made of baked clay, the mould and core being held apart by stays of iron wire. The melted bronze is run in upon the wax, which disappears before the advancing bronze, and runs out of exits prepared. Thus the space occupied by the model, which, we have seen, was made of wax, is now taken up by the bronze, which must be, if successfully cast, an exact reproduction of the original of the model.

Large or monumental works are sometimes cast in one piece, but oftener in parts, which are afterwards united by heating and application of melted metal.

Bronze, as has been already mentioned, is given its color, or "patina," after it has been cast. The green bronze color is sometimes produced on metal by the application of vinegar, or dilute

nitric acid, or sal ammoniac. To give the color of an antique bronze to new-made work in bronze or brass, ¾ of an ounce of sal ammoniac and a drachm and a half of bin-oxalate of potash (salt of sorrel) is dissolved in a quart of vinegar, and this solution rubbed over the bright metal until the surface becomes dry through the friction. The object should be kept warm, and the process repeated until the desired tone or color is found.

Almost any color may be imparted to copper, brass, or iron by an application of chloride of platinum, varying according to the number of applications and degree of dilution. For the bronzing of reliefs, medals, or coins, two parts of verdigris and one part of sal ammoniac are dissolved in vinegar, and the solution then boiled, skimmed, and diluted with water until it produces in the mouth a weak metallic taste, and, on further dilution, lets fall no precipitate. This solution, in turn, is boiled briskly and poured over the subject to be colored.

An occasional rubbing with oil will preserve and restore a fine bronze surface. For the cleansing of bronze statues, a diluted solution of caustic alkalies is used.

Cutting in Marble. — Modern sculptors do little work upon the marble with their own hands, which fact, in a measure, accounts for the characterless result of many finished statues, when compared with a clay model. The great sculptors have chosen at all times to finish their own work, or to direct it with closest scrutiny. Only so may favorable results be obtained. It is said that Michael Angelo carved his entire statues with his own hand. Very few sculptors now believe this. There is so much dull, mechanical work that the machine and "scarpolino" do better than the intellect, that such carving would be a waste of time. Then, too, "the hand of little practice hath the daintier sense," and the continuous striking upon the marble dulls the delicate sense of touch and feeling, and stiffens

the muscles. A sculptor who does all his marble work himself will finally do but little that is fine in modeling and cutting, and, from the tediousness, produce little work, all his time going to the developing of one production. A sculptor should certainly know how. The best carver or marble cutter is the man who is most faithful to your model and idea, and who has no creative genius of his own. The carving of net-work or any delicate design, often so much admired, is merely a labor of patience, and requires no more genius than do the broad and simple surfaces.

No matter what the statue is to be, the sculptor usually models a small sketch in clay or wax. When satisfied that his idea and action are fitted for plastic representation, and he has developed his little model to express that idea, he then sets up his iron skeleton or framework which is to support and form the core of his large work, whatever it may be. This and the following processes have already been fully described. Let us assume that the work is already cast in plaster of Paris, and ready for the firmer material of marble. The model to be copied is placed on a large block, called a "scale-stone." Having secured a block of marble of sufficient size, the operator places this also on a similar block. The most salient parts of the plaster model are marked with a lead pencil. These marks are to serve as points of measurement. The fronts of the "scale-stones" now receive marks that exactly correspond with these. An instrument known as a "pointing machine" is then brought into use. This is constructed with a simple cross as its main feature, and provided with socket joints, and arms that move readily upon them. At the extremity of one arm is affixed a "needle," which is so adjusted as to slide in and out easily, and yet is firmly held when desired. This "pointing machine" is then taken in hand by the carver, or pointer, and adjusted to three salient points of the model, which have been prepared to receive it. (See cut No. 19.) The movable arm is then adjusted to the first point of measurement, such as, for example, the

No. 19. — THE "POINTER" AT WORK.

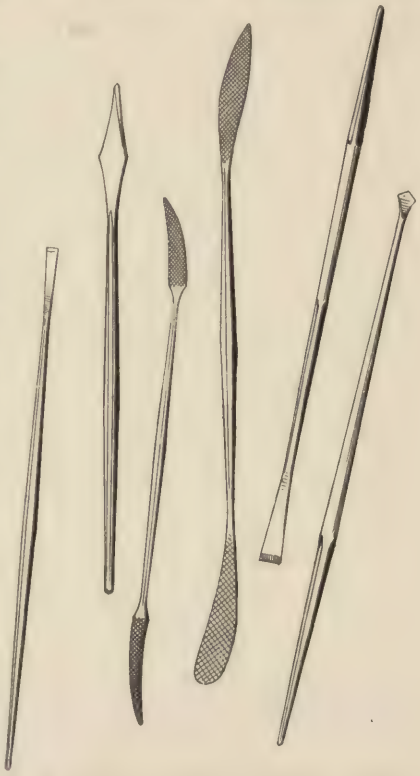
end of the nose. The "needle" is extended until it touches the pencil mark at this point. The whole instrument is now removed from the model and applied to the block of marble, upon which three corresponding salient points have been marked. It fits into these as it did upon the model. We find, however, that the "needle" does not reach the same depth as it did upon the model. The operator therefore removes his machine, and chisels as much of the marble away as he deems safe. Then he places the machine for a second trial. This process is repeated until the "needle" reaches the required depth. A pencil mark is then made to show that the point is found. In cutting away the operator is careful not to reach the extreme point desired, but to leave a slight surface of perhaps the thickness of a piece of paper. This, in the final finishing, is removed with the chisel or rasp. (For marble tools see cut No. 20.)

This process is continued until the work to be reproduced is shaped out. A superior workman is now employed, who, with chisel, rasp, and file, copies and develops the more delicate portions of the work. This part of the work is done under the direct supervision of the sculptor himself. Variety of texture and the harmonizing of the whole is finally done by the sculptor's own hand. (See cut No. 21.)

A rich quality of surface is produced by rubbing with fine sand, pumice-stone, or some similar substance. Michael Angelo polished some of his statues, as did many of the ancients. The sharp points of reflected light, however, take from the fine effect of the form. A solution of tea, hot wax, or oils of peculiar quality are often used in producing a mellow tint upon the surface of the marble. This process is quite distinct from Polychromy, or the coloring of sculpture.

Polychromy. — In ancient Egypt statues were colored for religious purposes. It was intended to make them look as nearly like the original as possible, and so deceive the spirit, or Ka, should he

return to the tomb and find that his mummy had been removed. With the Greek, color was used for decorative purposes, or was an accident of the material used. In architecture it enhanced the splendor of the whole, and was a foil to the figures in the frieze. In the middle ages color was often used, and all interior sculpture was colored.



No. 20. — TOOLS USED IN MARBLE CUTTING.

The coloring of parts of a statue destroy the unity and harmony of the whole. Place sculpture in its appropriate and native light, and color will be unnecessary. One may accept as a principle, that any detail of execution that draws our attention from the consideration of a statue as a whole, is bad art. The plastic sense is confused thereby, no matter how we may open our eyes in wonder. If it can be shown that color was in vogue in the best days of Greek art, there is no reason for it that has yet been shown other than private caprice. The coloring of the great "Minerva" and "Jupiter" was, in a measure, accidental, that is, color was the attribute of the precious material of which these colossal statues were constructed. Phidias used these materials because it was

required of him to do so. If the effect was strikingly magnificent, it was at the expense of grander emotions. The Greek evidently first took color, with his idea of form, from Egypt. There color, as before indicated, had a religious significance. The Greek continued, somehow, to use it as an ornament when its symbolical force had entirely disappeared. No doubt, in decorative sculpture color has a place, but it should be used only by a master who can distinguish the picturesque from the sculpturesque.

Models. — One seldom finds perfect proportion in the models of to-day. The right side is apt to be more developed than the left, in the bones as well as the muscles. The development in both sexes depends, of course, largely upon the occupation pursued. An all-round athlete is the finest type of physical development to be found. Many good models may be seen in the modern circus. The best models that can be found to-day are men who, starting with good health, have taken sufficient exercise to develop a sound and symmetrical body, and have at the same time rounded out the moral and intellectual sides of their natures. A perfectly developed man should be rounded out physically, morally, and intellectually. It is difficult to find models with the lower extremities of sufficient length. In fact, the artist's power of selection must be brought constantly into play. One model will have finely developed legs, but thin and scrawny arms, and vice versa; another with a splendid torso has a short and insufficient neck, and so on. In the female model the most common defects are: an unequal distribution of fat over the lower part of the figure, perhaps a thin and bony chest, or a too broad pelvis. The sculptor must create his ideal figure from a number of models, selecting with great care a perfect part from each, and combining all parts into a harmonious and organic whole.

No. 21. — THE CARVER OR FINISHER AT WORK.

Art Study Abroad. — The École des Beaux Arts holds examinations twice a year, in February and July. Any American is eligible. The candidate is examined in History, Perspective, Anatomy, Architecture, Drawing, and Modeling. Those who do not reach a certain standard are not admitted. For the examination in history, a list of questions is prepared which may be obtained from the secretary of the school a month before the examination takes place. This list consists of not more than thirty-five questions. Answers may be written in English if candidate prefers that tongue.

In Perspective, some simple problem is given. In Anatomy, the drawing of one or two bones of the human body is required, such as the femur and the knee-joint. In Architecture, the pupil is required to make a scale drawing of a simple column or entablature of one of the Five Orders. In Modeling, one is expected to copy some bas-relief or simple cast from the antique.

The examinations occupy nearly a month. Those who pass successfully have the privilege of study in one of the ateliers and attending lectures for two years without expense. A small fee is demanded, however, on entering the school, for the use of the materials.

The professors visit their respective studios at the school twice each week. The school hours are from 8 to 12.30 A.M. in the winter, and from 7 to 11 A.M. in the summer. Each student is criticised separately. The lectures in Anatomy by Professor Duval may be attended by students outside the school.

Most students work in a private atelier in the afternoon or evening. One of the most frequented schools for drawing is the Académie Colarossi, where men and women study together. M. Colarossi has two schools, one at No. 8 Rue de la Grande Chaumière; also No. 39 Avenue d'Eylau or Victor Hugo. He has an able corps of professors.

The galleries of the national museums are open every day except Monday. One may obtain a card on application which will admit

him to any museum and allow him to work there. Temporary permissions are accorded by the Director; he may be seen on every Tuesday and Thursday from 10 to 2 o'clock. A student should learn the laws and restrictions of these museums.

Not much good art is seen in the shop windows of Paris, and the student must depend largely on the galleries of the Louvre, the Luxembourg, and occasional exhibitions, and the yearly Salons. Every student should visit the churches of Paris, which contain many fine works of art.

The American Art Association at 131 Boulevard Montparnasse furnishes all information regarding boarding-houses, hotels, physicians, the diplomatic service, and art and color merchants. The candidate should present himself at the Association on his arrival in Paris, for by so doing he will save time and money. On the production of credentials he will be given a card of admission to the Association gratis for one month. If considered suitable for membership, he may be admitted by the payment of $2.00 initiation fee and annual dues of $5.00. Information there will be given regarding the curriculum of the "Julien" school, as well as others we have mentioned. Applications for admission should be made to the Secretary.

Living abroad is not as cheap as it is reported in America. Every detail of the expense may be readily learned by application at the American Art Association, and more space need not be devoted to this subject.

Art Study at Home. — The author of this work is satisfied from his own experience and from careful observation and investigation, that art may be studied as successfully in America as abroad, be it in Munich, Paris, or Rome. There is not time to discuss this subject at any length; but the author advises any one, who is about to pursue

the serious study of art, to visit the art schools of this country before incurring the expense of a trip to Europe, and the dangers of studying art in a foreign country.

Art for America must be developed upon American soil; and where a man of strong individuality and character may safely pursue art study abroad, a dozen will sink into servile imitation of foreign masters. There is not the excuse now which was formerly urged for foreign study; we have at this time well furnished museums, and thoroughly equipped schools of art.

Greece did not become great in the fine arts by sending her young men to study in Egypt or the Orient. Until the last few years, one may say until the World's Fair, art study was pursued with difficulty in this country; but now the Art Students' League in New York, the Pratt Institute in Brooklyn, the art schools at Chicago and Boston, or the leagues in Washington, St. Louis, and other cities, afford all necessary advantages. The facilities offered are in most cases better than those to be found in Paris or elsewhere on the continent. The rooms are better ventilated, the surroundings healthier, to say nothing of the purer moral atmosphere, and the life and environment much more conducive to an enduring national art.

The author has developed this subject at some length in his book "Art for America," by Roberts Brothers, but has felt it necessary to insert in a later work this earnest plea for American art, and the men who are giving their lives to make it sincere, noble, and lasting.

APPENDIX.

APPENDIX.

LIST OF SCULPTORS AND THEIR PRINCIPAL WORKS.

AGASIAS (Greek), *b.* 400 B.C. Fighting Gladiator. *Louvre, Paris.*

AGELADAS (Greek), *b.* 500 B.C. No work extant.

AGESANDER (Greek), unknown. One of the three sculptors of Laocoön. *Vatican, Rome.*

AGNOLO DI BACCIO (Italian), *b.* 1460, *d.* 1543. *Palazzo Bartolini, Florence.*

AGNOLIO (Italian), *b.* about 1260.

AGOSTINO (Italian), *b.* about 1265, *d.* about 1350. *Church San Francesco, Siena.*

AGRATE, MARCO FARRERIO (Italian), *b.* about 1500. The four elements.

ALBANO, FRANCESCO (Italian). San Bartholomeo, so called.

ALCHIMEDES (Greek), *b.* 500 B.C. Venus of the gardens.

ALGARDI, ALESSANDRO (Italian), *b.* 1600, *d.* 1654. St. Leo forbidding Attala to enter Rome. *St. Peter's, Rome.*

ALLEGRAIN, CHRISTOPHER GABRIEL (French), *b.* 1710, *d.* 1795. Nude figures.

AMMANATO, BARTHOLOMEO (Italian), *b.* 1511, *d.* 1590. *Ponte Della Trinità, Florence.*

ANDREA PISANO (Italian), *b.* 1270, *d.* 1345. Bronze relief gates at *San Giovanni, Florence.*

ANGUIER, FRANÇOIS (French), *b.* 1604, *d.* 1669. Tomb of Cardinal de Berrulle at *Moulins.*

ANGUIER, MICHEL (French), *b.* 1612, *d.* 1686. Group of the nativity in the church of Valle de Grasse.

APOLLODORUS (Greek), *b.* 350 B.C.

APOLLONIUS (Greek), *b.* 200 B. C. Toro Farnese. *Naples.*

APOLLONIUS (Greek). Torso Belvedere. *Vatican, Rome.*

ARISTIDES (Greek), *b.* 490 B.C.

ARISTOCLES (Greek), *b.* 600 B.C. Of Cydonia.

ARISTOCLES (Greek), *b.* 400 B.C. Of Sicyon.

ARISTOMEDES (Greek), *b.* about 550 B.C. Cybele.

ATHENADORUS (Greek), *b.* about 350 B.C. Portraits busts of women.

ATHENADORUS (Greek). One of the three sculptors of Laocoön. *Vatican, Rome.*

BARTOLINI, LORENZO (Italian), *b.* about 1777, *d.* 1850 A.D. Colossal bust of Napoleon I.

BARTOLOMMEO, MAESTRO (Italian), *b.* about 1390. Porta della Carta, chief entrance to the *Doge's Palace, Venice.*

BARYE, ANTOINE LOUIS (French), *b.* 1795, *d.* 1875. Lion strangling a boa. *Paris.*

BECERRA, GASPERO (Spanish), *b.* 1520, *d.* 1570. Statue of the Virgin. *Madrid.*

BEGARELLI (Italian), *b.* 1498, *d.* 1565. Celebrated modeler in stucco. Intimate of Correggio.

BERNINI, GIOVANNI LORENZO (Italian), *b.* 1598, *d.* 1680. Colonnade at entrance, *St. Peter's, Rome.*

BERRUGUETE, ALONZO (Spanish), *b.* ——, *d.* 1561. Restored the Alhambra. *Spain.*

BOSIO, FRANÇOIS JOSEF (Italian), *b.* 1769, *d.* 1845. Cupid darting arrows.

BOUCHARDON (French), *b.* 1698, *d.* 1762. Fountain of Grenelle, *Paris.*

BRUNELLESCHI, FILIPPO (Italian), *b.* 1377, *d.* 1444. Dome of the Cathedral, *Florence.*

BUONAROTTI, MICHAEL ANGELO (Italian), *b.* 1474, *d.* 1563. Moses. *St. Peter's, Rome.*

BUPALUS (Greek), *b.* 550 B.C.

CAFFIERI, JEAN JACQUES (French), *b.* 1723, *d.* 1792. Statue of Molière.

CAIN, AUGUSTE, *b.* 1822, *d.* 1894. The Eagle defending his prey.

CALAMUS (Greek), *b.* about 450 A.D. Colossal bronze statue of Apollo.

CALICLES (Greek), *b.* about 430 B.C.

CANACHUS (Greek), *b.* about 400 B.C.

CANO, ALONZO (Spanish), *b.* 1600, *d.* 1667. The high altar of the church of Lebrija with statue of Virgin and child at *Grenada.*

CANOVA, ANTONIO (Italian), *b.* 1757, *d.* 1822. Theseus vanquishing the Minotaur. *Vienna.*

CARPEAUX, JEAN BAPTISTE (French), *b.* 1827, *d.* 1875. Group of dancing girls in front of Opera House, *Paris.*

CAVELIER, PIERRE JULES (French), *b.* 1814. Statue of Truth. *Luxembourg, Paris.*

CELLINI, BENVENUTO (Italian), *b.* 1500, *d.* 1570. Perseus and Medusa. *Florence.*

CEPHISODOTUS (Greek), flourished about 17 B.C. The Nine Muses.

CEPHISODOTUS, the younger, lived about 300 B.C. Probably the author of the two youths wrestling in *Tribune, Florence.*

CHANTRY, SIR FRANCIS (English), *b.* 1782, *d.* 1841. Bronze statue of William Pitt. *London.*

CHARES (Greek), *b.* about 300 B.C. The Colossus at *Rhodes.*

CHAUDET, ANTOINE DENIS (French), *b.* 1763, *d.* 1810. Oedipus.

CLEOMENES (Greek), *b.* 300 B.C. Probably author of the Venus de Medici, *Florence.*

CLEVES, CORNEILLE VAN, *b.* 1645, *d.* 1738.

COLOMB, MICHEL (French), *b.* 1431, *d.* 1514. Tomb of François II., Duke of Bretagne.

CORTOT, JEAN PIERRE (French), *b.* 1787, *d.* 1843. The Soldier of Marathon.

COUSIN, JEAN (French), *b.* 1500, *d.* 1590. Painting of the Last Judgment.

COUSTOU, GUILLAUME (French), *b.* 1678, *d.* 1746. Two groups, each of which is composed of a horse prancing, and a groom, at entrance Champs-Élysées, *Paris.*

COUSTOU, NICHOLAS (brother of Guillaume), *b.* 1658, *d.* 1733. Group representing the junction of the Seine and Marne. *Paris.*

COYSEVOX, ANTOINE (French), *b.* 1640, *d.* 1720. Two bronzed horses at the *Tuileries, Paris.*

DAMEAS (Greek), *b.* 1400 B.C. Statue of the athlete Milo in the Temple of Olympia.

DANNECKER, JOHANN HEINRICH VON (German), *b.* 1758, *d.* 1841. Ariadne on the panther.

DANTAN, ANTOINE LAURE (French), *b.* 1798, *d.* 1878. Bas-relief of Silène.

DANTAN, JEAN PIERRE (brother of Antoine), *b.* 1800, *d.* 1869. Bust of Cherubini.

DAVID, PIERRE JEAN (French), *b.* 1789, *d.* 1856. Pediment of the Pantheon. *Paris.*

DESBŒUFS, ANTOINE (French), *b.* 1493, *d.* 1562.

DESJARDINS, MARTIN-BOGAERT (Dutch), *b.* 1640, *d.* 1694. Masterpiece. Colossal group, Louis XIV. Destroyed in the Revolution.

DONATELLO, DONATO, DE BELTO DI BARDO (Italian), *b.* 1383, *d.* 1466. St. George, façade of *San Michel, Florence.*

DRAKE, FRIEDRICH (German), *b.* 1805, *d.* 1882. Allegorical group of the eight provinces of Prussia.

DUBOIS, PAUL (French), *b.* 1829.

DUMONT, FRANÇOIS (French), *b.* 1688, *d.* 1726. Statue of thunder-struck Titan.

DUMONT, JACQUES EDME (French), *b.* 1761, *d.* 1844. Grandson of François Dumont.

DUPATY, CHARLES MERCIER (French), *b.* 1771, *d.* 1825. Ajax pursued by Neptune.

DUPRE, JEAN or GIOVANNI (Italian), *b.* 1817, *d.* 1882. Pieta, *Siena.*

DÜRER, ALBERT (German), *b.* 1471, *d.* 1528. The Three Graces. *Carlsruhe.*

DURET, FRANCISQUE (French), *b.* 1805, *d.* 1866. Statue of Molière, *Hall of Institute, Paris.*

FALCONNET, ÉTIENNE MAURICE (French), *b.* 1716, *d.* 1791. Colossal statue in bronze of Peter the Great, *St. Petersburg.*

FALGUIERE (French), *b.* ——, *d.* ——. Young martyr. *Luxembourg, Paris.*

FLAXMAN, JOHN (English), *b.* 1755, *d.* 1826. Shield of Achilles. Group of the archangel Michael and Satan.

FRANCHEVILLE, PIERRE (French), *b.* 1548, *d.* 1620. Group, Time bearing away Truth.

FRÉMIET, EMMANUEL (French), *b.* 1824. Joan of Arc. *Paris.*

GEEFS, GUILLAUME (Belgian), *b.* 1806, *d.* 1860. Statues of Rubens and Malebran.

GEEFS, JAN JOSEPH (Belgian), *b.* 1811, *d.* 1885. Adonis departing to the chase.

GHIBERTI, LORENZO (Italian), *b.* 1378, *d.* 1455. Bronze gates of the Baptistry, *Florence.*

GIOVANNI, PISANO, son of Nicola (Italian), *b.* ——, *d.* 1320.

GIRARDON, FRANÇOIS (French), *b.* 1630, *d.* 1715. Sculptures of the "Fountain of the Pyramids."

GLAUCIAS (Greek), *b.* 480 B.C.

GLAUCUS (Greek), *b.* at Chios, 6th century B.C.

GLYCON (Greek). Farnese Hercules.

GOUJON, JEAN (French), *b.* 1530, *d.* 1572. Bas-reliefs of Naiads for the "Fountain of the Innocents," *Paris.*

GUILLAIN, SIMON (French), *b.* 1581, *d.* 1658. The statues in the church of the Sarbonne, *Paris.*

GUILLAUME, JEAN BAPTISTE CLAUDE, *b.* 1582, *d.* 16—. The tomb of the Gracchi.

HEGIAS (Greek), *b.* 450 B.C. Statue of Minerva.

HOUDON, JEAN ANTOINE (French), *b.* 1741, *d.* 1828. Statue of Voltaire. *Theatre Français, Paris.*

HUSSON, JEAN HONORE ARISTIDE (French), *b.* 1803, *d.* 1864. Bas-relief of Dante and Virgil.

JOHN OF BOLOGNA (Flemish), *b.* 1524, *d.* 1608. The Flying Mercury. *Bargello, Florence.*

KAESCHMANN, JOSEPH (German). Jason carrying away the golden fleece.
KISS, AUGUSTUS (German), *b.* 1802, *d.* 1865. Amazon attacked by a tiger. *Berlin.*
KRAFFT, ADAM (German), *b.* 1429, *d.* 1507. A tabernacle in the church of *St. Lawrence, Nuremberg.*

LAMAIRE, PHILIPPE HENRI (French), *b.* 1798, *d.* 1880. Pediment for *Madeleine, Paris.*
LYSIPPUS (Greek), *b.* about 330 B.C. Apoxyomenus. *Vatican, Rome.*

MILLET, AIMÉ (French), *b.* 1819, *d.* 1891. Ariadne.
MOITTE, JEAN (French), *b.* 1746, *d.* 1810. A bas-relief of France.
MONTELUPO DA BACCIO (Italian), *b.* 1445, *d.* 1533.
MONTORSOLI, FRA GIOVANNI ANGELO (Italian), *b.* 1500, *d.* 1563. Fountain in front of *Cathedral, Messina.*
MYRON (Greek), lived 480 B.C. The Discobolus. *Vatican, Rome.*

NAUCIDES (Greek). Mercury.

ONATAS (Greek), lived about 460 B.C. Statue of Apollo.
ORCAGNA, ANDREA DI CIONE (Italian), *b.* about 1308, *d.* about 1368. The Loggia di Lanzi. *Florence.*

PAGOU (French), *b.* 1730, *d.* 1809. Statue of Pascal.
PERRAUD (French), *b.* 1821, *d.* 1876.
PHIDIAS (Greek), *b.* about 485 B.C. Sculptures of the Parthenon.
PHITEUS (Greek), *b.* about 353 B.C. Tomb of Mausolus, king of Caria.
PIGALLE, JEAN BAPTISTE (French), *b.* 1714, *d.* 1785. Monumental group at Strasburg, in honor of Marshall Saxe.
PILON, GERMAIN (French), *b.* 1515, *d.* about 1590. A marble group of Three Graces. *Louvre, Paris.*
PISANO, GIOVANNI, son of Niccolò (Italian), *b.* 1238, *d.* 1320. High altar in Cathedral of *Arezzo.*
PISANO, NICCOLÒ (Italian), *b.* 1226, *d.* 1273.
POLYCLES (Greek), *b.* about 370 B.C. Hermaphrodite.
POLYCLETUS (Greek), *b.* about 450 B.C. Doryphorus the Spear-bearer.
POLYDORUS (Greek). One of the sculptors of the Laocoön.
PORTA, DELLA, GIACOMO (Italian), *b.* 1525, *d.* 1605. Portal of St. John. *Lateran, Rome.*

PRADIER, JACQUES (French), *b.* 1792, *d.* 1852. Psyche ; Atlanta and Niobe group *Louvre.*

PRAXITELES (Greek), *b.* about 360 B.C. Hermes, at Olympia.

PUGET, PIERRE (French), *b.* 1622, *d.* 1694. Milo of Crotona.

RAUCH, CHRISTIAN (German), *b.* 1777, *d.* 1857. Statue of Frederick the Great. *Berlin.*

ROBBIA, ANDREA DELLA (Italian), *b.* 1444, *d.* 1527. Works in enameled terra-cotta.

ROBBIA, GIOVANNI DELLA (Italian), *b.* 1470.

ROBBIA, GIROLAMO DELLA (Italian). Statue of Catherine di Medicis.

ROBBIA, LUCA DELLA (Italian), *b.* about 1388, *d.* 1463. Reliefs on the Campanile and Choir of the *Cathedral, Florence.*

ROLLAND, PHILIPPE LAURENT (French), *b.* 1746, *d.* 1816. Statues of Homer and Solon.

ROMAN, JEAN BAPTISTE LOUIS (French), *b.* 1792, *d.* 1835.

ROUBILIAC, LOUIS FRANÇOIS (French), *b.* 1695, *d.* 1762. Statue of Shakespeare.

RUDE, FRANÇOIS (French), *b.* 1784, *d.* 1855. Relief on Arc of Triumph, *Paris.*

SANSOVINO, JACOPPO TATTI (Italian), *b.* 1479, *d.* 1570. Statues of Mars and Neptune. *Doge's Palace, Venice.*

SCHADOW, JOHANN GOTTFRIED (German), *b.* 1764, *d.* 1850. Statue of Frederick the Great.

SCHWANTHALER, LUDWIG MICHAEL (German), *b.* 1802, *d.* 1848. Statue of Bavaria. *Munich.*

SCOPAS (Greek), *b.* 400 B.C. Statues of Venus, Vesta and Apollo.

SIMART, PIERRE CHARLES (French), *b.* 1806, *d.* 1857. Statues and reliefs for the *Louvre.*

SOLA, ANTONIO (Spanish), *b.* 1790. Group of Daoiz and Velarde.

STEINBACH, ERWIN VON (German), *b.* ——, *d.* 1318. Worked upon his own design for the door of the tower of the *Strasburg Cathedral.*

THEODORUS (Greek), 600 B.C. An early sculptor in bronze.

THIERRY, JEAN (French), *b.* 1669, *d.* 1739. Worked in Spain for Philip V.

THOMAS, JOHN (English), *b.* 1813, *d.* 1862. Statues in the Houses of Parliament

THORNYCROFT, HAMO, *b.* March 9, 1850.

THORWALDSEN, ALBERT BERTEL (Danish), *b.* 1770, *d.* 1844. Lion of Lucerne.

TIMOTHEUS (Greek), *b.* about 350 B.C. Statue of Diana.

VERROCCHIO, ANDREA (Italian), *b.* 1432, *d.* 1488. Equestrian statue of Colleoni. *Venice.*

VISCHER, PETER (German), *b.* 1460, *d.* 1540. Tomb of St. Sebald. *Nuremberg.*

WESTMACOTT, SIR RICHARD (English), *b.* 1775, *d.* 1856. Statue of George III. *Windsor.*

WESTMACOTT, RICHARD (English), *b.* 1799, *d.* 1872. David the slayer of Goliath.

CERTAIN VALUABLE BOOKS ON SCULPTURE.

"Introductory Studies in Greek Art." *Jane E. Harrison.* New York: Macmillan & Co.

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"Lectures on Sculpture." *John Flaxman.* Cincinnati: Robert Clark & Co.

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"Masks, Heads and Faces." *Ellen Russell Emerson.* Boston: Houghton, Mifflin & Co.

"Talks on Art." *W. M. Hunt.* Boston: Houghton, Mifflin & Co.

"Anatomy of the External Forms of Man," for the use of Artists, Painters and Sculptors. *Dr. J. Fau;* edited by Dr. Robert Knox. Cincinnati: Robert Clark & Co.

"Elementary Artistic Anatomy," for the use of Art Schools. *Dr. J. Fau;* translated and edited by C. Carter Blake. Cincinnati: Robert Clark & Co.

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"Art, its Laws and the Reasons for them." *Samuel P. Long.* Boston: Lee & Shepard.

"Anatomy in Art." *Jonathan Scott Hartley.* New York.

Winkelmann's "History of Ancient Art."

Hamilton's "Thoughts on Art."

Kugler's "Hand-book of Italian Schools."

Crowe's "Hand-book of German, Flemish and Dutch Art."

Lubke's "History of Art."

Mrs. Clement's "Painters, Sculptors, Architects, Engravers and their Works."

Lessing's Works on Art.

Ruskin's Works on Art.

Charles Waldstein's "Phidian Essays."

Davidson's "Parthenon Frieze" and "Essays."

Goodyear's "Evolution of Ornament" and other works.

Lucy Mitchell's "History of Sculpture."

Tuckermann, H. T., "The Book of Artists — American Artist's Life."

Johnson, E. W., "The Studio Arts."

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"Two French Sculptors." *W. C. Brownell.* In Century Magazine for Nov., 1890.

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L'Art. Paris.

ART PUBLICATIONS.

Foremost among the art publications of America one should mention the *Art Interchange*. This monthly compares favorably with the English *Art Journal*, and is better suited to our needs. Its information is varied, but not too much so for a nation where every branch of art is being earnestly studied. The author advises all art students to read the *Interchange*, and so keep pace with contemporaneous art movements. Its editorial page is not the slave of its advertising sheet, as is too often the case with other art publications and reviews.

The art publications of George Barrie & Co. of Philadelphia are worthy of kindest notice. Mr. Barrie has published many expensive books at a financial loss, because of his love for true art. His publications compare favorably with any in the world.

AMERICAN BRONZE FOUNDERS AND FOUNDRIES.

It would seem fitting that the industry of bronze founding should have some mention in this book, and while there are at the present time numerous successful foundries in America, I shall make mention only of those of which I have some personal knowledge.

M. H. Mosman, of Chicopee, Mass., is a founder of bronze who brings to his work not only the fine qualities of an artist, but a remarkable and noteworthy devotion. It was at the Chicopee Foundry that the equestrian statue of Washington, by Thomas Ball, was cast. This work has stood the test of time and weather. Mr. Mosman has discovered a happy secret for fusing bronze. The author recommends this foundry and the sincere man who stands at its head.

The Gorham Manufacturing Company of New York has established a successful foundry at Providence, R. I. This department is in the hands of Mr. J. H. Buck and his son, A. A. Buck, who bring intelligence and courtesy to their work. Their terms are moderate, and the work conscientiously executed. They have shown remarkable success in the casting of small pieces, animals, statuettes, etc. The author believes this company, and the gentlemen in charge of this department, to be in every way trustworthy.

THE HENRY BONNARD BRONZE COMPANY has had for some years a successful foundry in New York City. This company refers with pride to a number of large works executed at its foundry, which have given satisfaction to American sculptors.

There is another foundry in New York City which has been conducted for many years by MR. P. E. GUERIN at 21 and 23 Jane St. Here excellent small work has been done. John Rogers has had the originals of his groups cast there, and he speaks highly of the integrity of this house.

The author is satisfied that bronze casting can now be done in this country as successfully as abroad; that is, the casting in sand moulds. The new process of casting in wax moulds, or the revival of old processes, is conducted with more safety in Rome, Paris, and England; but he believes that in the near future casting by the "lost wax" method will become popular here, and be accomplished as successfully as the casting by sand moulds. It is only right that American sculptors should encourage, as far as they are able, the American founders; for it has taken courage and endurance to open and sustain a bronze foundry in this country where art is still in its beginnings.

THE PANTOGRAPH PRINCIPLE.

The following description of a new machine involving the pantograph principle may prove helpful and interesting. At one end of a horizontal bench is a universal joint to which is attached a rod or arm. This arm supports two tool carriages, and has a longitudinal groove for convenience in adjusting and keeping the carriages in their proper position. One of these carriages supports a stump or runner, and the other a graving point. The carriages are also connected by a rod in such a manner that in conjunction with the arm supporting them perfect freedom of motion in every direction is attained with the stump, which is, of course, exactly duplicated by the graving tool. On the bench are two turn-tables so adjusted that their position can be varied at will and revolved without changing their relative positions. The tables are fixed opposite the carriages, and one receives the model and the other the block of plaster or other material which is to be transformed into a reproduction of the model on a reduced or enlarged

scale. The operator holds the stump lightly, and makes it pass over the entire surface of the model, while at the same time the sharp steel graver cuts into the plaster block, and reproduces mathematically the model, inasmuch as both tools work from the same centre. The proportions of the reproduction are fixed by the mathematical adjustment of the turn-tables and carriages above mentioned. As all the parts slide on their supports, the enlargement or reduction is not in the least arbitrarily fixed, but can be changed as much or as little from any given size within the limits of the machine as the operator may wish. It is obvious that in a complete revolution of the tables, an infinity of points on the model may be touched by the stump, and exactly duplicated by the graver on the reproduction; consequently it is possible to obtain a reproduction of the entire surface of the model. By the variety of tools which may be used, the large planes as well as the finer surfaces of the model are quickly reproduced, making it possible to complete a complicated piece, not only with absolute accuracy, but also with great rapidity.

Mr. Ira G. French has invented a modeling machine embodying the pantograph principle, which the author has at present in his studio, and which, from practical test, he has found to be an entire success. It may be moved easily from one part of the studio to another, which is a great convenience. The author has used other machines, and finds this the only moulding machine in which there is no lost motion or distortion. It will enlarge or reduce work with the same fidelity.

INDEX.

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